

2006 Buick Lucerne CXS

2006 ACCESSORIES & EQUIPMENT Entertainment

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Entertainment

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Compact Disc (CD) Player (U1S) to Bracket Fasteners	2 N.m	18 lb in
Compact Disc (CD) Player (U1S) Mounting Fasteners	9 N.m	80 lb in
Digital Radio Receiver Fasteners	6 N.m	53 lb in
Door Speaker Retaining Fasteners	1.8 N.m	16 lb in
Radio Antenna Module Retaining Fasteners	9 N.m	80 lb in
Radio Retaining Fasteners	2 N.m	18 lb in
Rear Speaker Assembly Retaining Fasteners	2 N.m	18 lb in

SCHEMATIC AND ROUTING DIAGRAMS

ENTERTAINMENT SCHEMATIC ICONS

Entertainment Schematic Icons

Icon	Icon Definition
	<p>CAUTION:</p> <p>This vehicle is equipped with a Supplemental Inflatable Restraint (SIR) System. Failure to follow the correct procedure could cause the following conditions:</p> <ul style="list-style-type: none">• Air bag deployment• Personal injury• Unnecessary SIR system repairs <p>In order to avoid the above conditions, observe the following guidelines:</p> <ul style="list-style-type: none">• Refer to SIR Component Views in order to determine if you are performing service on or near the SIR components or the SIR wiring.• If you are performing service on or near the SIR

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components or the SIR wiring, disable the SIR system. Refer to [SIR Disabling and Enabling](#).



IMPORTANT:

Twisted-pair wires provide an effective "shield" that helps protect sensitive electronic components from electrical interference. If the wires were covered with shielding, install new shielding.

In order to prevent electrical interference from degrading the performance of the connected components, you must maintain the proper specification when making any repairs to the twisted-pair wires shown :

- The wires must be twisted a minimum of 9 turns per 31 cm (12 in) as measured anywhere along the length of the wires.
- The outside diameter of the twisted wires must not exceed 6.0 mm (0.2 in).

RADIO/AUDIO SYSTEM SCHEMATICS

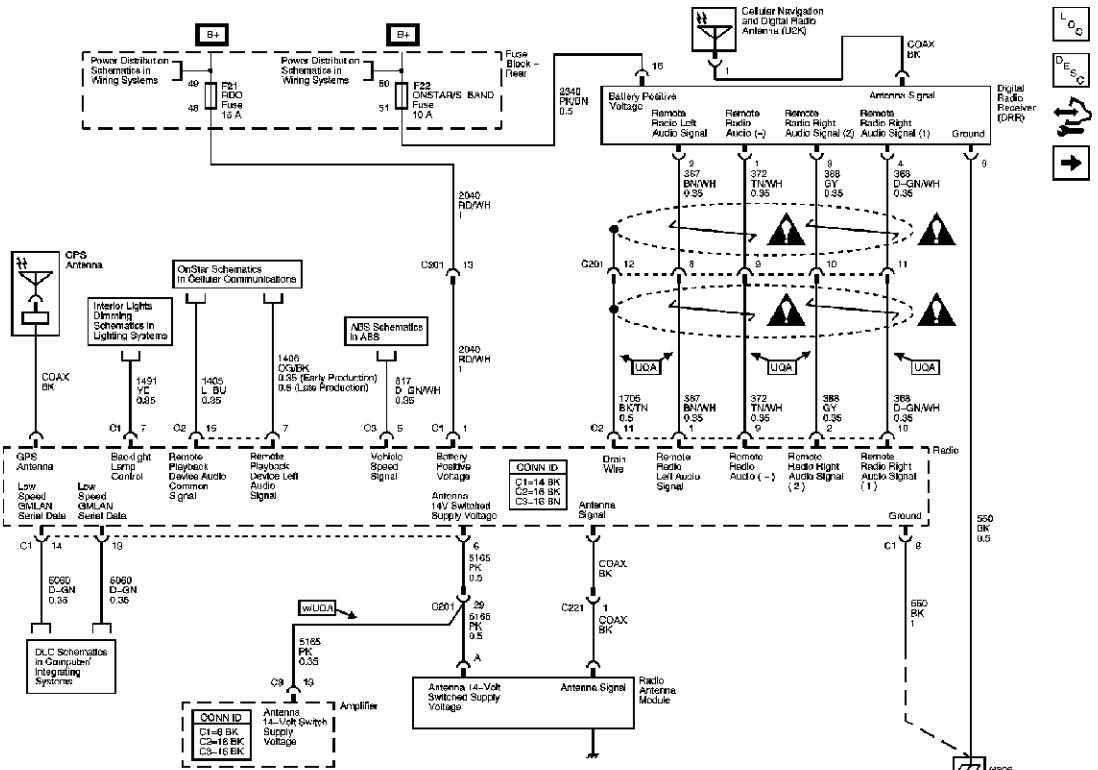


Fig. 1: Radio Power & Ground Schematic
Courtesy of GENERAL MOTORS CORP.

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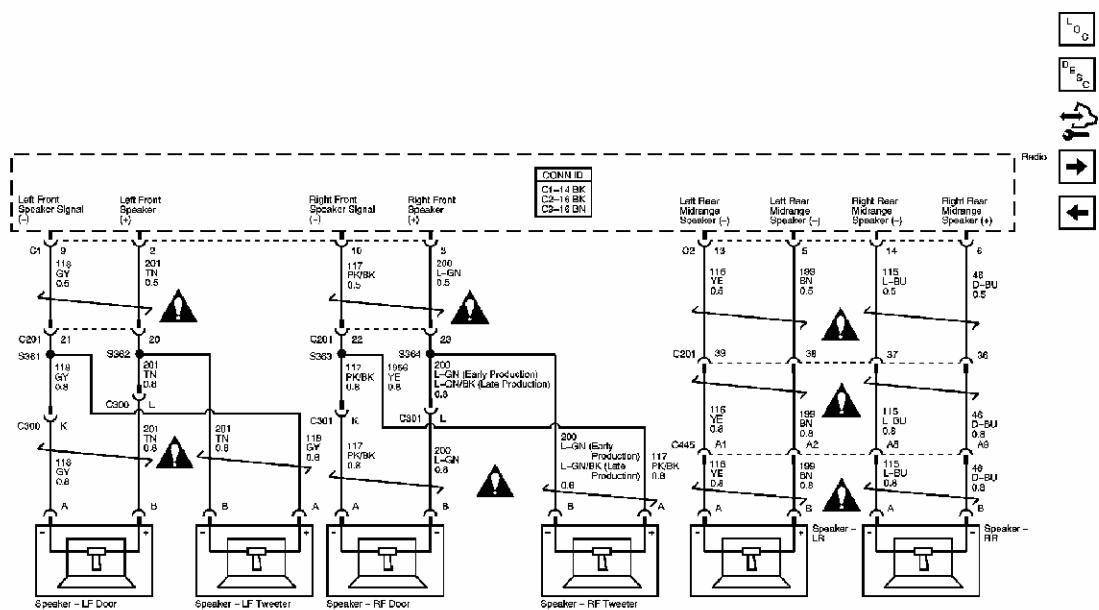


Fig. 2: Speakers (UQ3) Schematic

Courtesy of GENERAL MOTORS CORP.

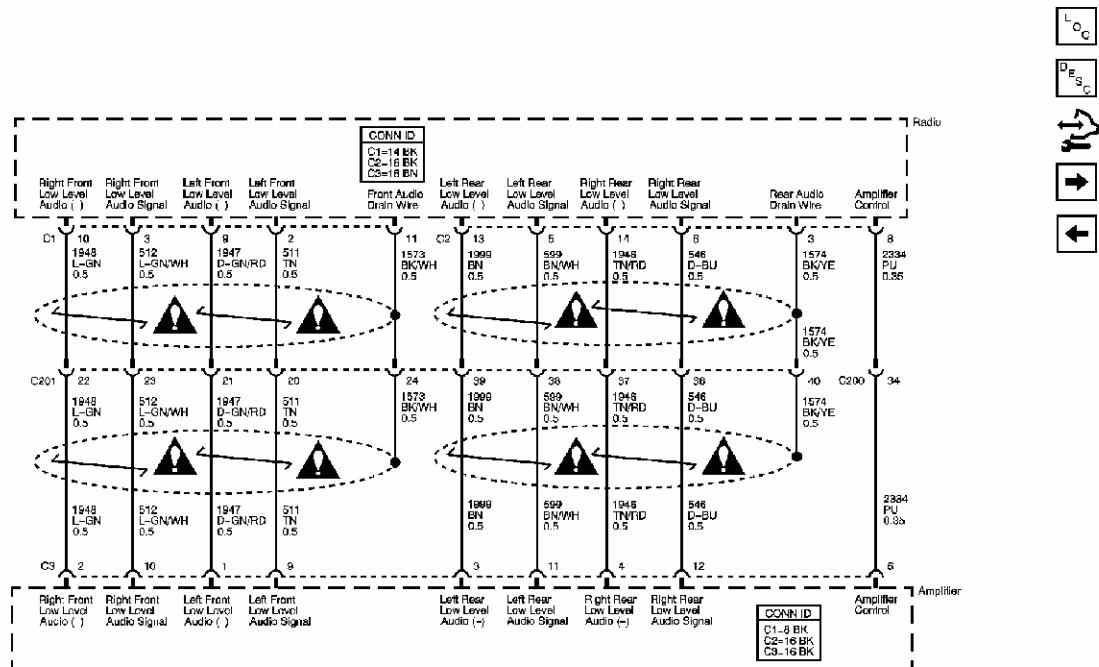


Fig. 3: Amplifier (UQA) Schematic

Courtesy of GENERAL MOTORS CORP.

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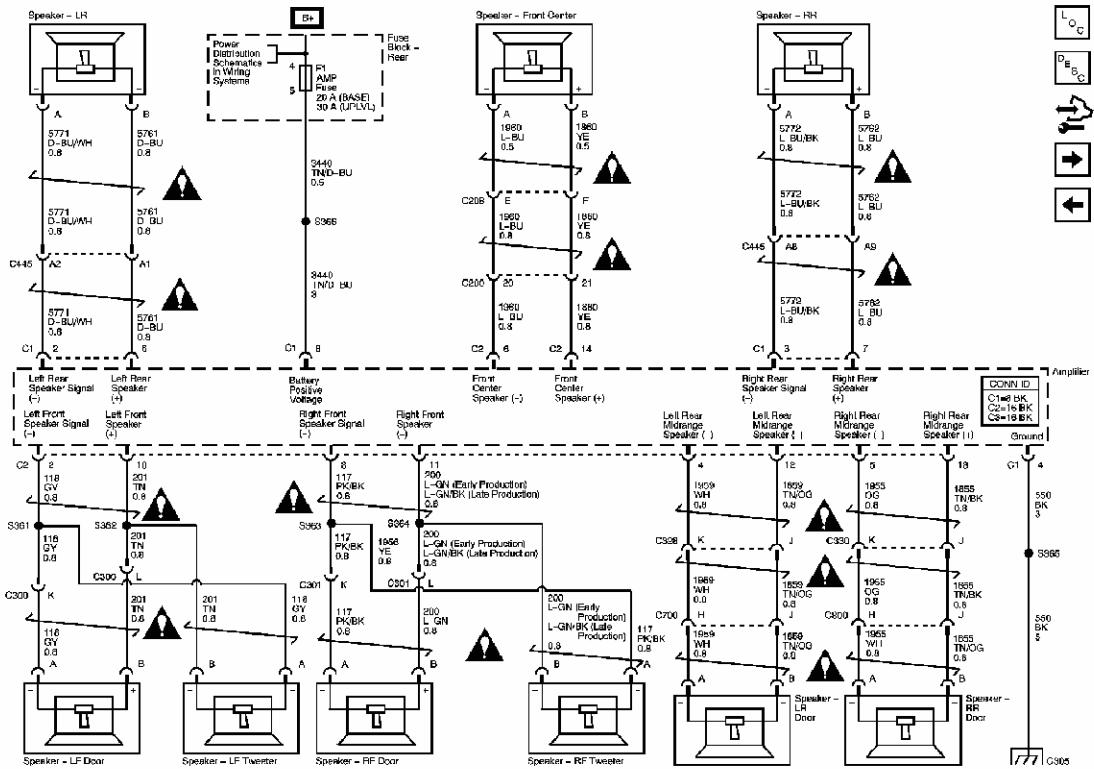
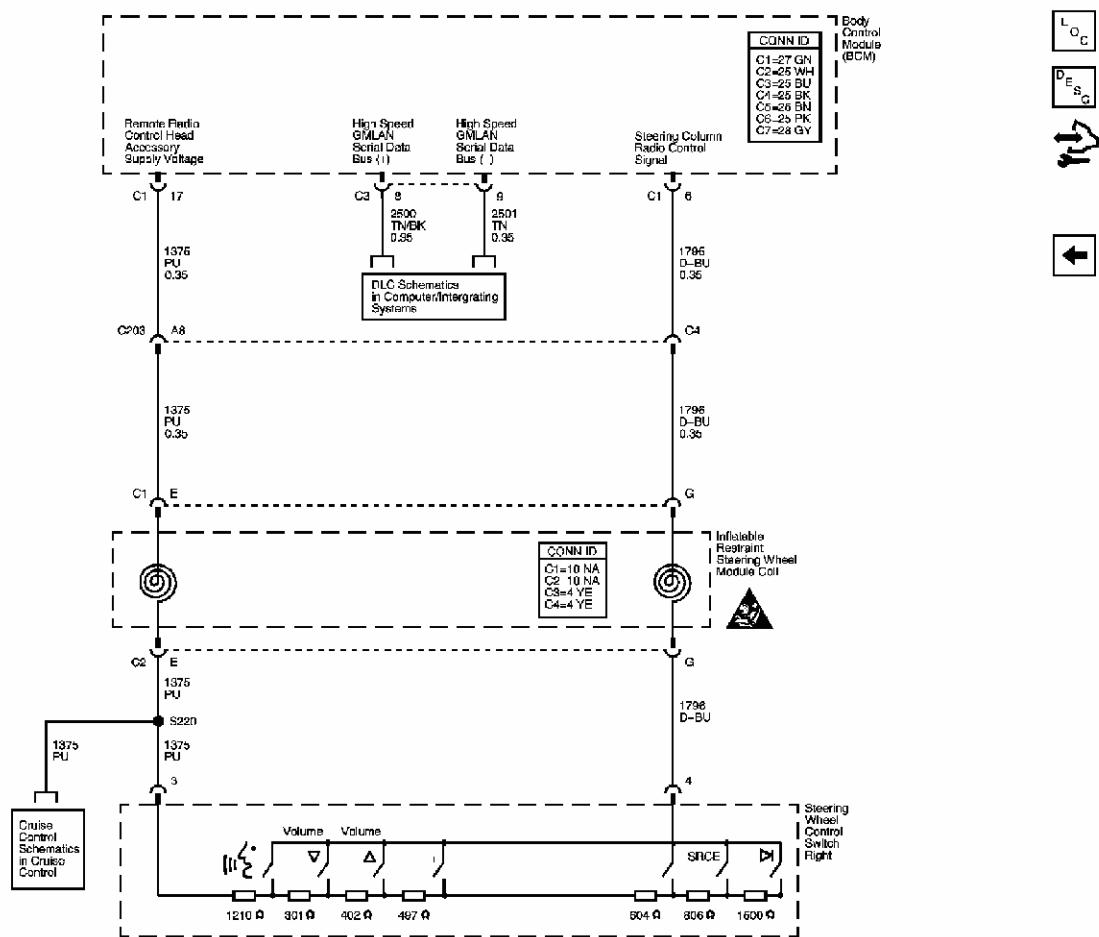


Fig. 4: Speakers (UQA) Schematic
Courtesy of GENERAL MOTORS CORP.

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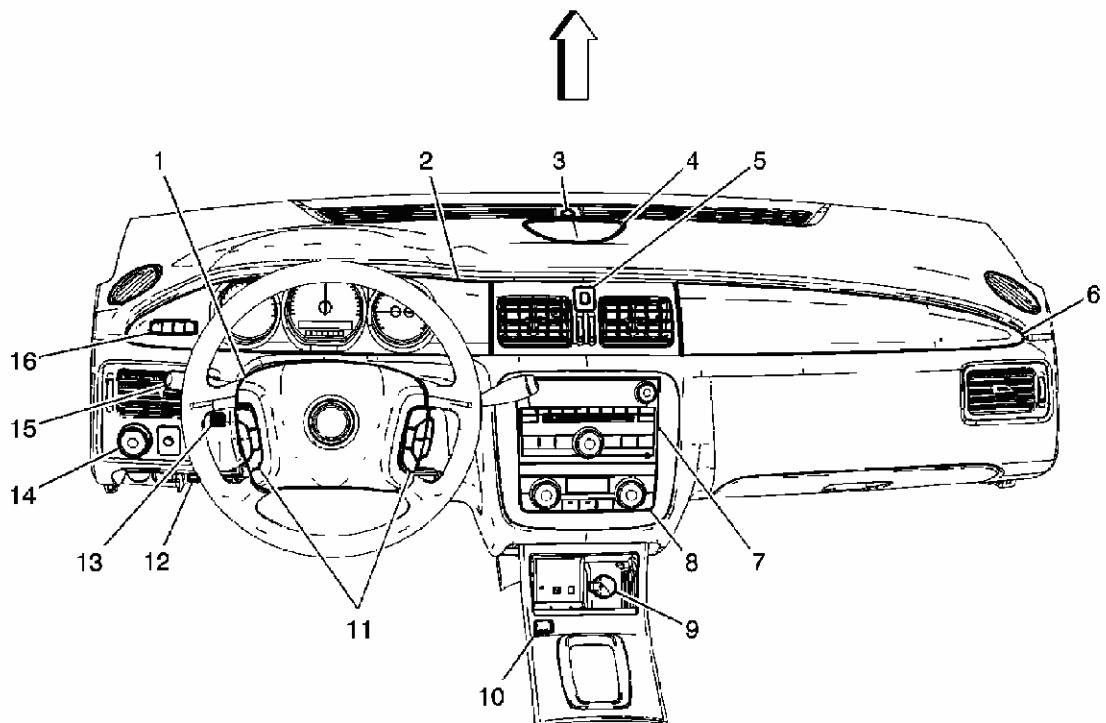


Fig. 6: Identifying Instrument Panel (I/P) Components

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 6

Callout	Component Name
1	Inflatable Restraint Steering Wheel Module
2	Instrument Panel Cluster (IPC)
3	Sunload Twilight Sensor
4	Speaker - Front Center (UQA)
5	Hazard Switch
6	Inflatable Restraint I/P Module
7	Radio
8	HVAC Control Module
9	Auxiliary Power Outlet - Console (A51)/Cigar Lighter (DT4 w/A51)
10	Traction Control Switch
11	Steering Wheel Controls
12	Data Link Connector (DLC)
13	Air Temperature Sensor - Inside (CJ2)
14	Headlamp Switch
15	Turn Signal/Multifunction Switch
16	Driver Information Display Switch

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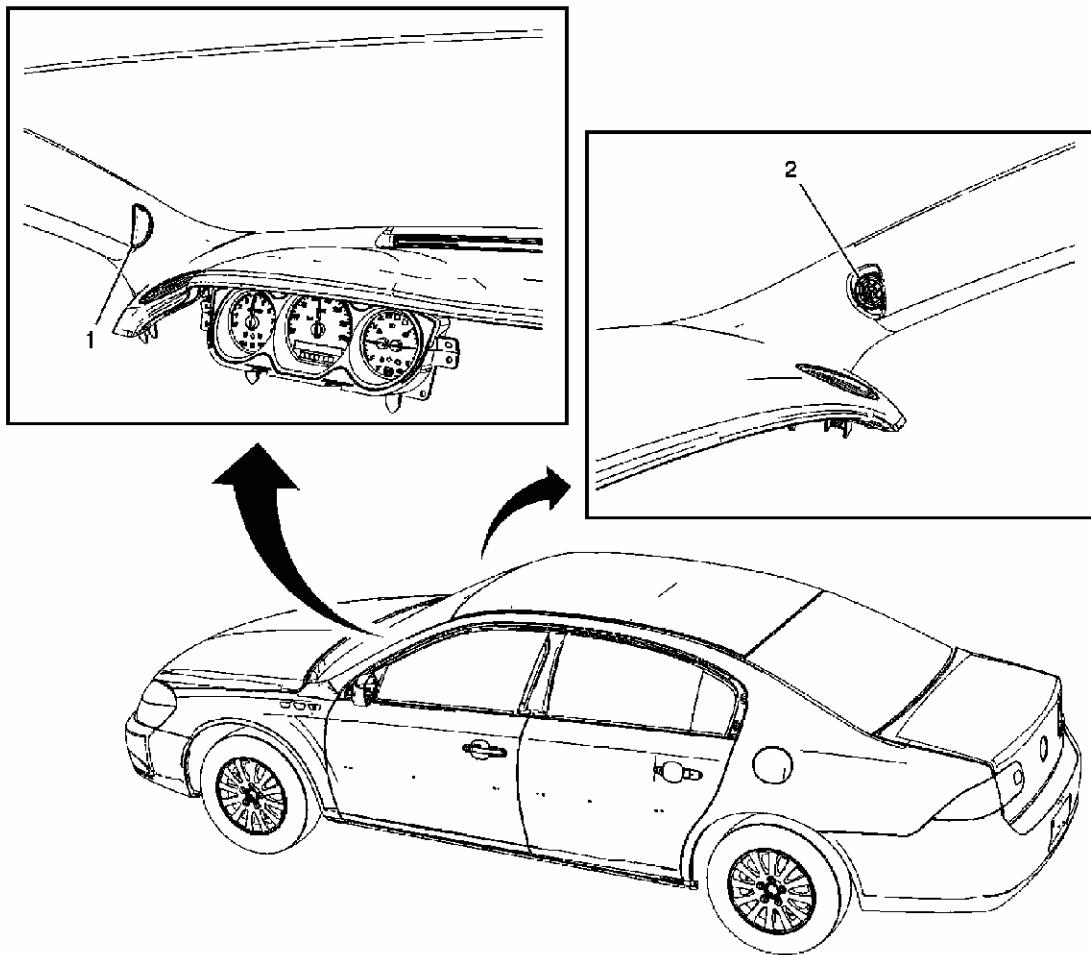


Fig. 7: View Of A-Pillar Speakers

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 7

Callout	Component Name
1	Speaker - LF Tweeter
2	Speaker - RF Tweeter

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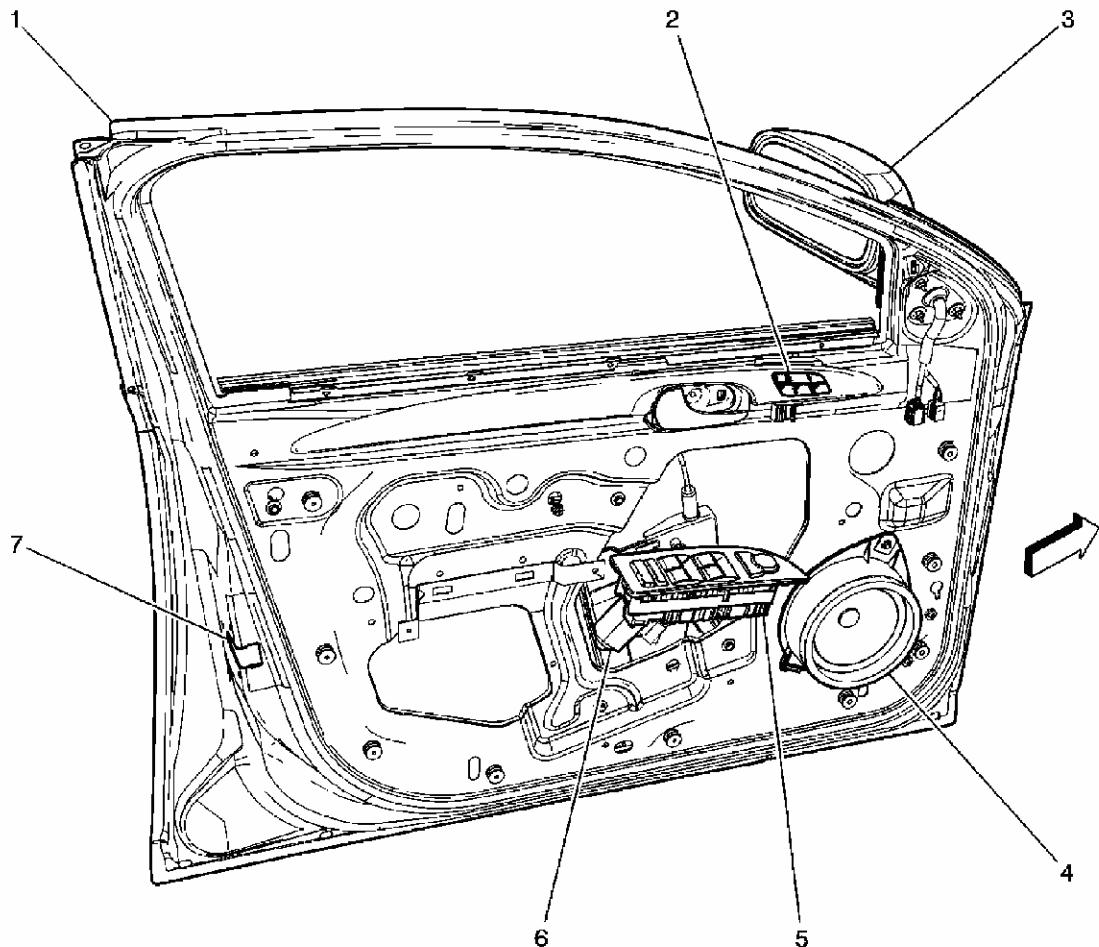


Fig. 8: Driver Door

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 8

Callout	Component Name
1	Door Frame
2	Heated and Cooled Seat Switch - Driver (KA1, KB6, A45)
3	Outside Rearview Mirror - Driver
4	Speaker - LF Door
5	Driver Door Module (DDM)
6	Window Motor - Driver
7	Door Latch Assembly - Driver

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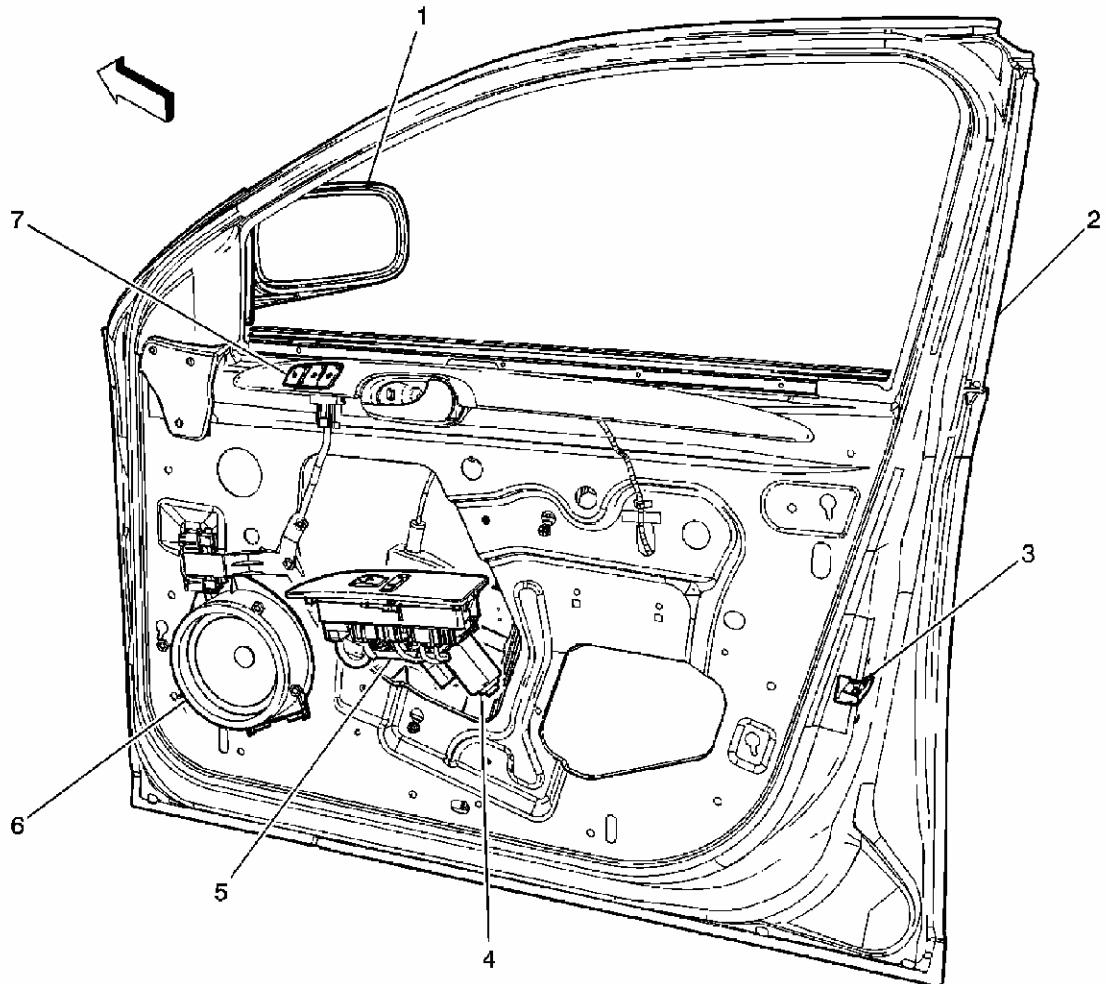


Fig. 9: View Of Passenger Door

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 9

Callout	Component Name
1	Outside Rearview Mirror - Passenger
2	Door Frame
3	Door Latch Assembly - Front Passenger
4	Window Motor - Driver
5	Front Passenger Door Module (FPDM)
6	Speaker - RF Door
7	Heated and Cooled Seat Switch - Front Passenger (KA1, KB6)

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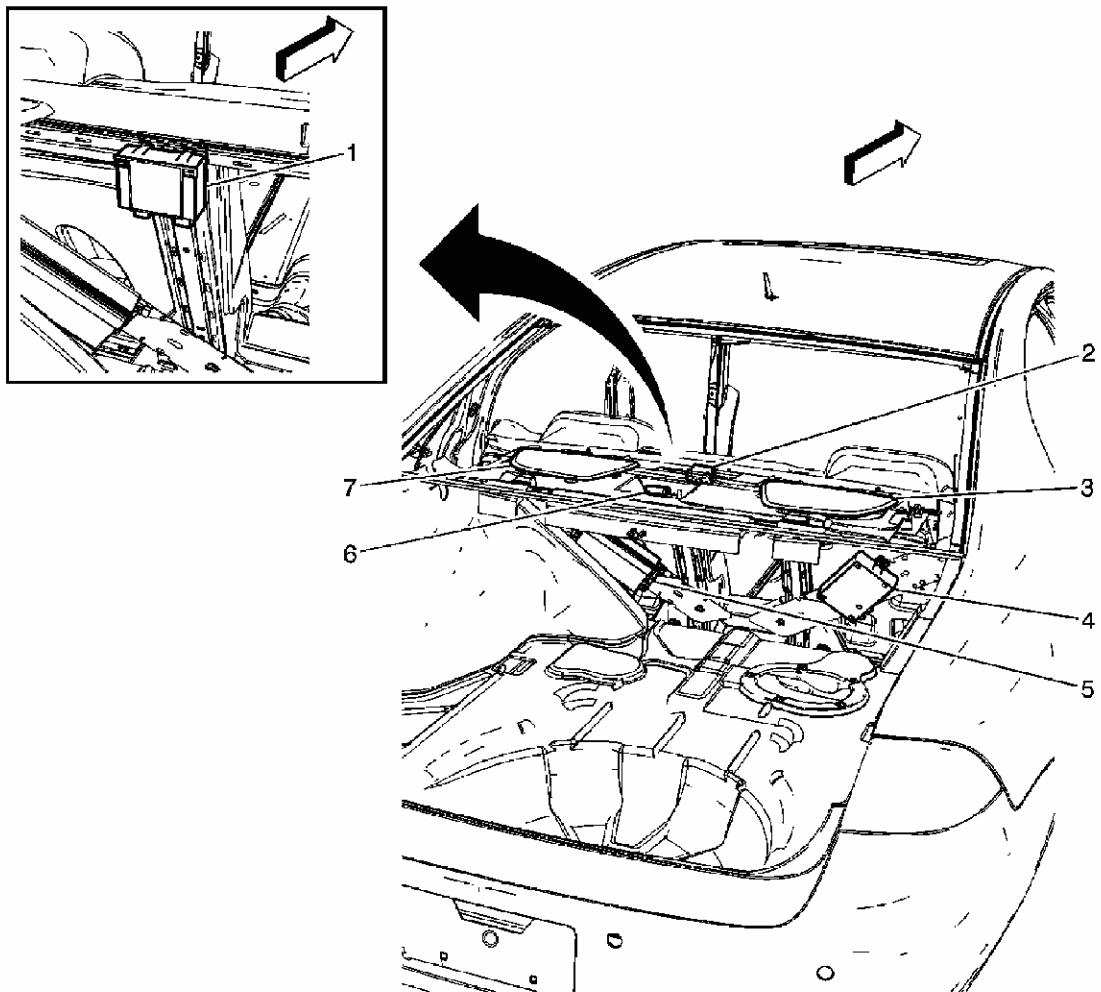


Fig. 10: View Behind Rear Seat

Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 10

Callout	Component Name
1	Remote Control Door Lock Receiver (RCDLR)
2	Rear Park Assist Indicator (UD7)
3	Speaker - RR
4	Vehicle Communication Interface Module (VCIM) (UE1)
5	Amplifier (UQA)
6	Rear Compartment Courtesy Lamp
7	Speaker - LR

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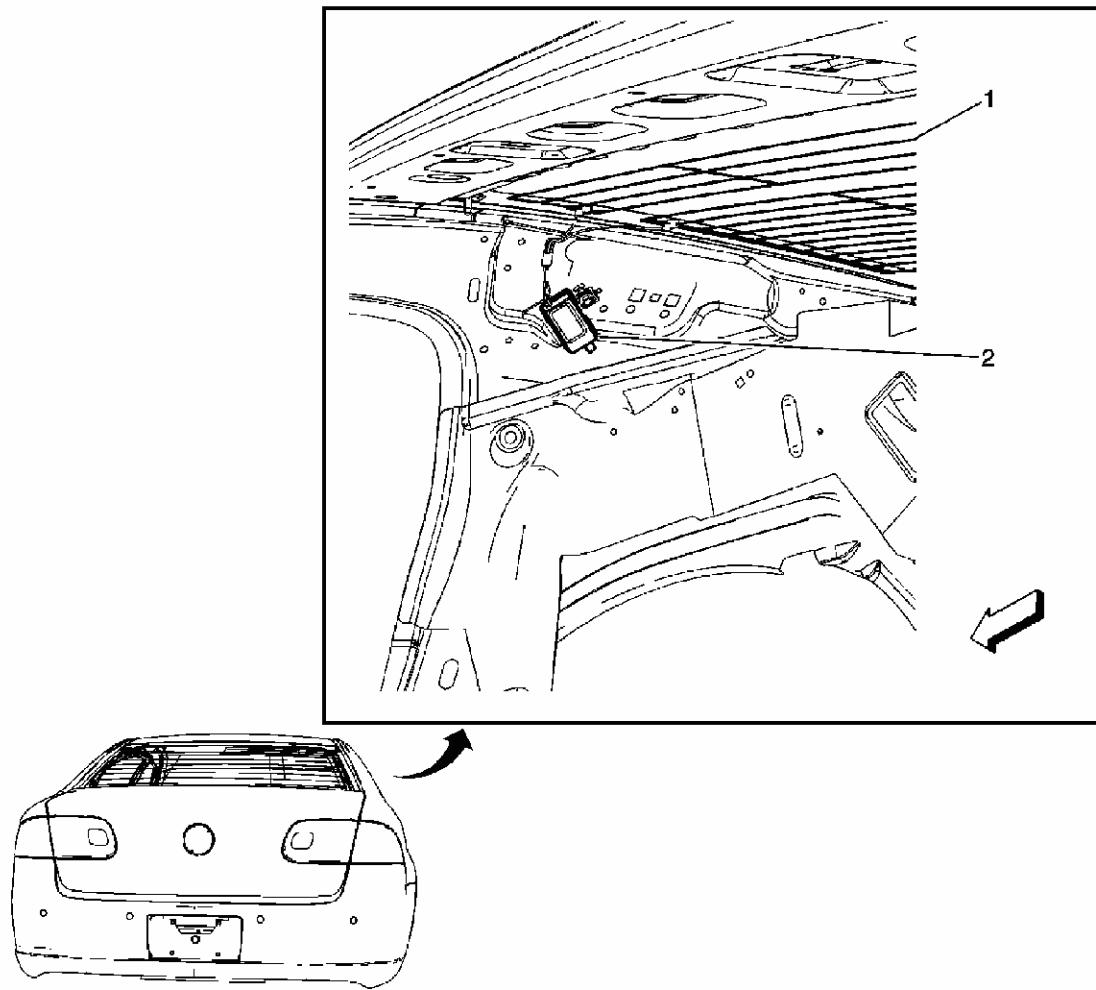


Fig. 11: View Above Right Rear Wheel Well
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 11

Callout	Component Name
1	Rear Window Antenna
2	Radio Antenna Module

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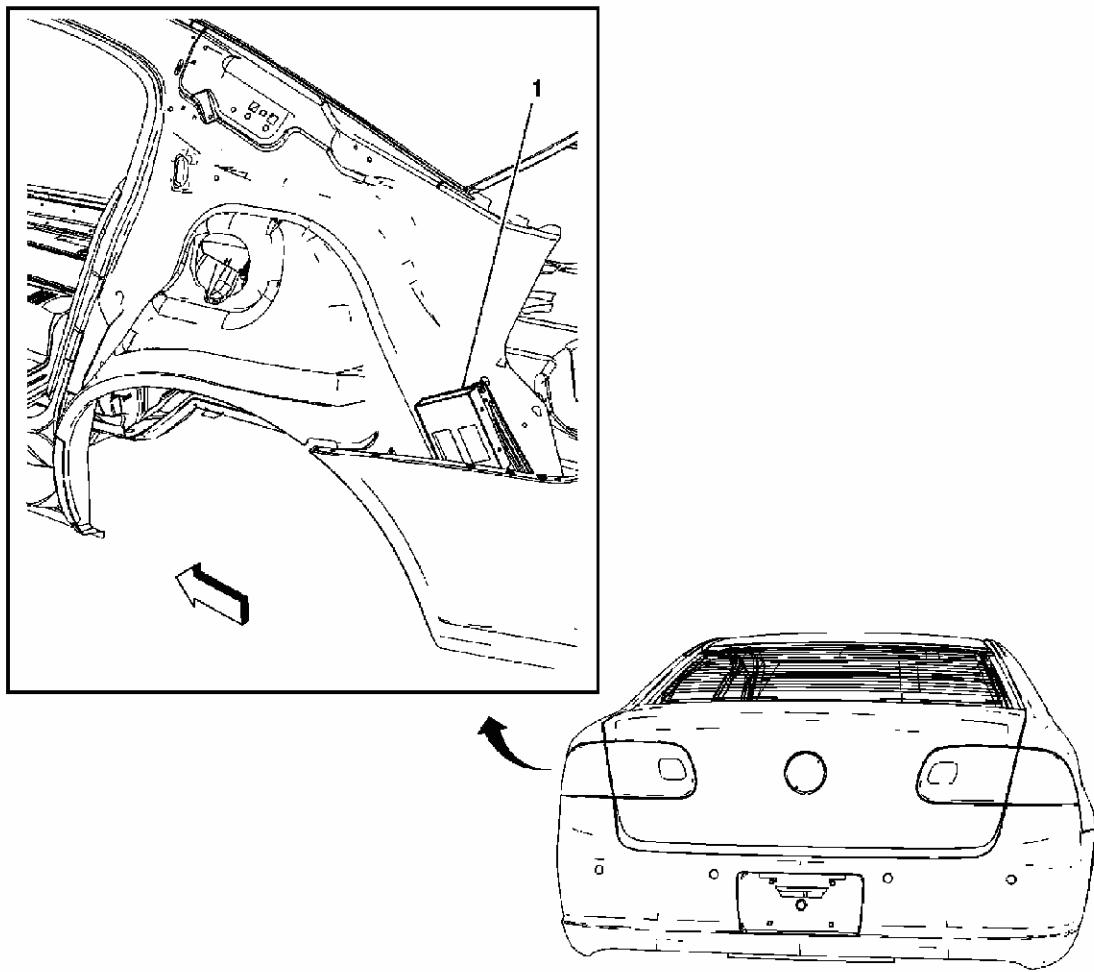


Fig. 12: View Behind Left Rear Wheel Well
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 12

Callout	Component Name
1	Digital Radio Receiver (DRR) (U2K)

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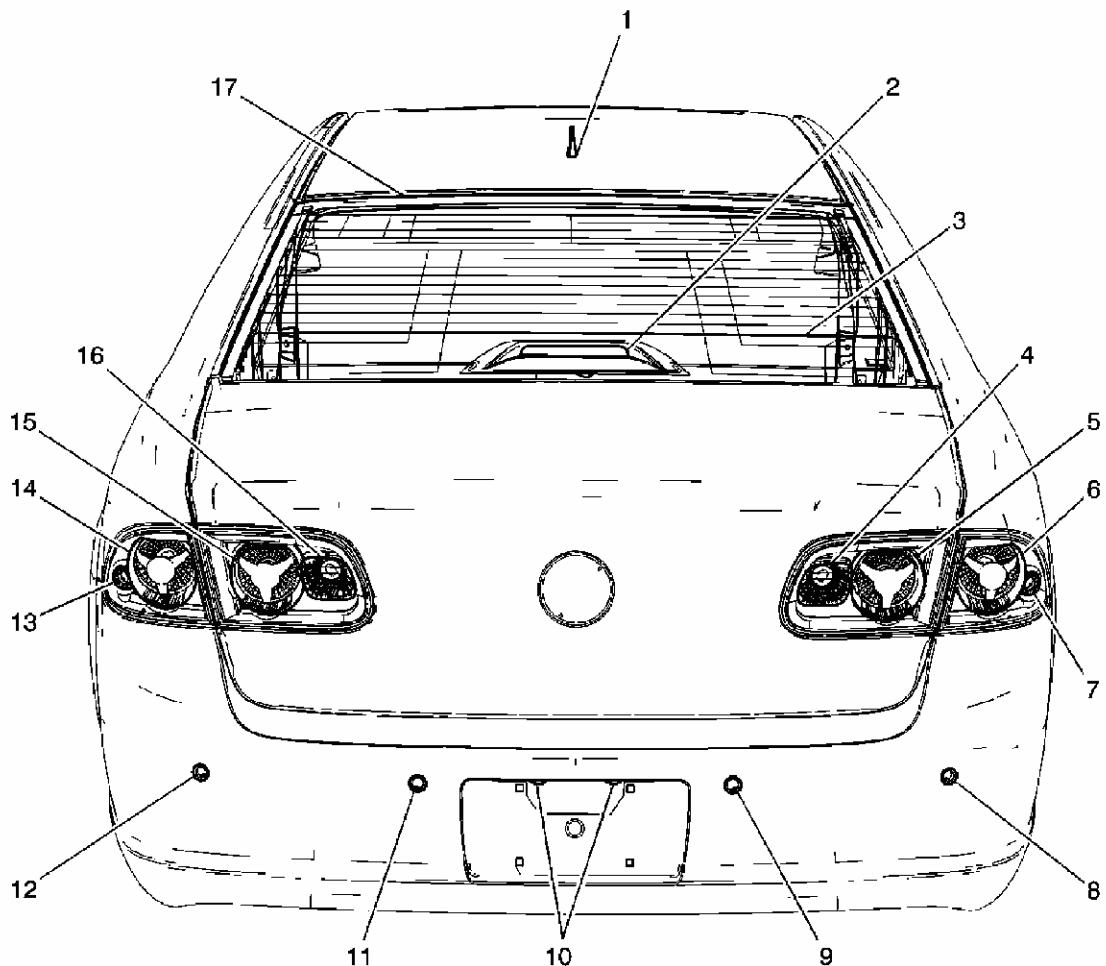


Fig. 13: View Of Rear Of Vehicle
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 13

Callout	Component Name
1	Cellular Navigation (UE1) and Digital Radio Antenna (U2K)
2	Center High Mounted Stop Lamp (CHMSL)
3	Rear Window Defogger
4	Backup Lamp - RR
5	Tail Lamp - Right Auxiliary
6	Stop/Turn Signal Lamp - RR
7	Marker Lamp - RR
8	Object Alarm Sensor - RR Corner (UFR)
9	Object Alarm Sensor - RR Middle (UFR)
10	License Lamps
11	Object Alarm Sensor - LR Middle (UFR)
12	Object Alarm Sensor - LR Corner (UFR)

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Callout	Marker Lamp - LR	Component Name
14	Stealth Tail Light Lamp (PEL)	Digital Radio Antenna (U2K)
15	Cache Light Mount	High Mount Stop Lamp (CHMSL)
16	Backup Lamp	Wind Defogger
17	Radio Lamp	Antenna

ENTERTAINMENT CONNECTOR END VIEWS

Amplifier C1 (UQA)

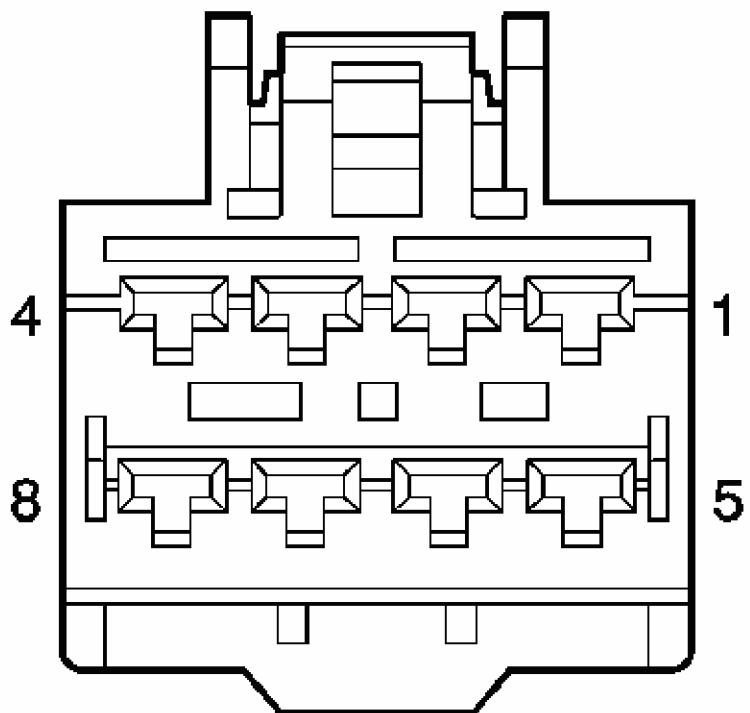


Fig. 14: Amplifier C1 (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 6098-4713
- Service: 88988652

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- Description: 8-Way F (BK)

Terminal Part Information

- Pins: 2
- Terminal/Tray: 8100-4445/22
- Core/Insulation Crimp: F/D
- Release Tool/Test Probe: 15315247/J-35616-35 (VT)

- Pins: 3, 4, 7, 8
- Terminal/Tray: 8100-4444/22
- Core/Insulation Crimp: 2/A
- Release Tool/Test Probe: 15315247/J-35616-35 (VT)

Amplifier C1 (UQA)

Pin	Wire Color	Circuit No.	Function
1	-	-	Not Used
2	D-BU/WH	5771	Left Front Speaker Signal (-)
3	L-BU/BK	5772	Right Front Speaker Signal (-)
4	BK	550	Ground
5	-	-	Not Used
6	D-BU	5761	Left Front Speaker (+)
7	L-BU	5762	Right Front Speaker (+)
8	TN/D-BU	3440	Battery Positive Voltage

Amplifier C2 (UQA)

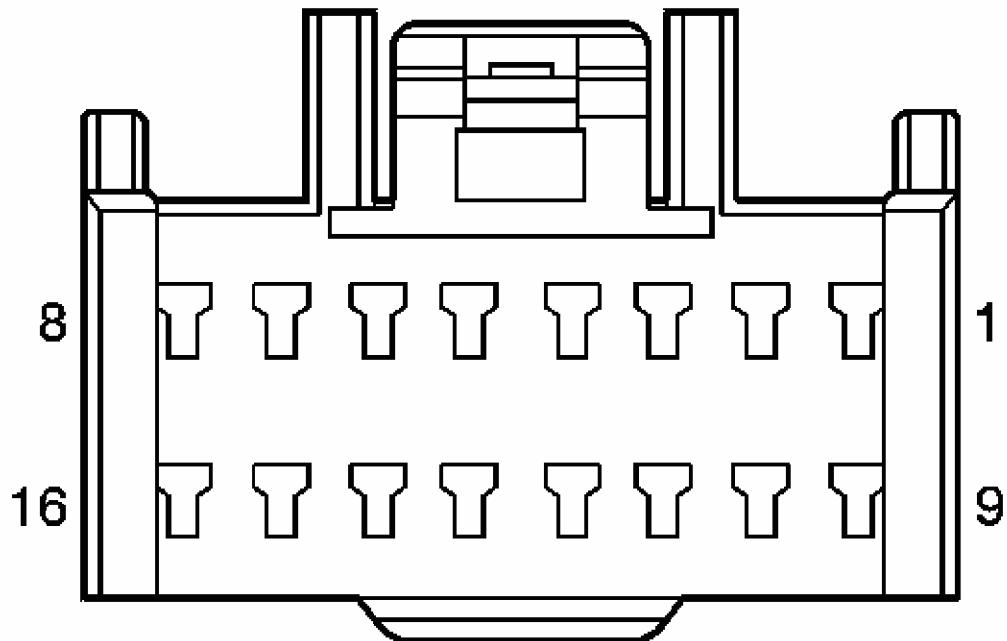


Fig. 15: Amplifier C2 (UQA) Connector End View

Courtesy of **GENERAL MOTORS CORP.**

Entertainment Connector End Views

Connector Part Information

- OEM: 6098-4611
- Service: 15134091
- Description: 16-Way F (BK)

Terminal Part Information

- Pins: 2, 3, 4
- Terminal/Tray: 8240-0127/22
- Core/Insulation Crimp: E/C
- Release Tool/Test Probe: 15315247/J-35616-2A (GY)
- Pins: 5, 6, 13, 14
- Terminal/Tray: 8240-0128/22
- Core/Insulation Crimp: C/A

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Connector Part Information 15315247/J-35616-2A (GY)

Amplifier C2 (UQA)

Pin	Wire Color	Circuit No.	Function
1	-	-	Not Used
2	GY	118	Left Front Speaker Signal (-)
3	PK/BK	117	Right Front Speaker Output (-)
4	WH	1959	Left Rear Midrange Speaker (-)
5	OG	1955	Right Rear Midrange Speaker (-)
6	L-BU	1960	Front Center Speaker (-)
7-9	-	-	Not Used
10	TN	201	Left Front Speaker (+)
	L-GN	200	Right Front Speaker (+) (Early Production)
11	L-GN/BK	200	Right Front Speaker (+) (Late Production)
12	TN/OG	1859	Left Rear Midrange Speaker (+)
13	TN/BK	1855	Right Rear Midrange Speaker (+)
14	YE	1860	Front Center Speaker (+)
15-16	-	-	Not Used

Amplifier C3 (UQA)

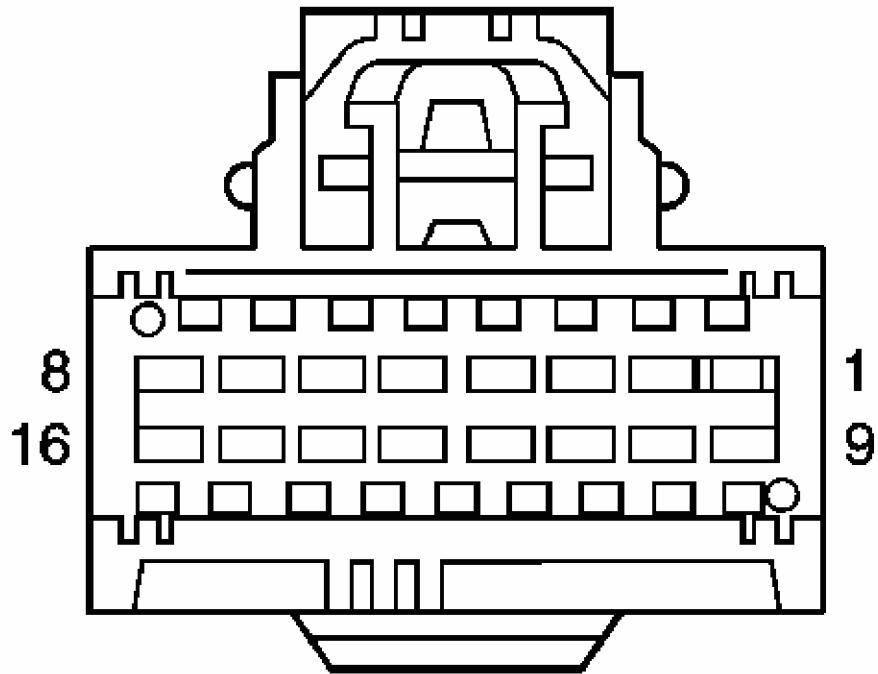


Fig. 16: Amplifier C3 (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 7283-9076-30
- Service: 15136073
- Description: 16-Way F (BK)

Terminal Part Information

- Pins: 3, 4, 6, 11, 12, 13
- Terminal/Tray: 7116-4618-02/14
- Core/Insulation Crimp: P/P
- Release Tool/Test Probe: J-38125-215/J-35616-64B (L-BU)

Amplifier C3 (UQA)

Pin	Wire Color	Circuit No.	Function

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1	D-GN/RD	1947	Left Front Low Level Audio (-)
2	L-GN	1948	Right Front Low Level Audio (-)
3	BN	1999	Left Rear Low Level Audio (-)
4	TN/RD	1946	Right Rear Low Level Audio (-)
5	-	-	Not Used
6	PU	2334	Amplifier Control
7-8	-	-	Not Used
9	TN	511	Left Front Low Level Audio Signal
10	L-GN/WH	512	Right Front Low Level Audio Signal
11	BN/WH	599	Left Rear Low Level Audio Signal
12	D-BU	546	Right Rear Low Level Audio Signal
13	PK	5165	Antenna 14V Switched Supply Voltage
14-16	-	-	Not Used

Digital Radio Receiver (DRR) (U2K)

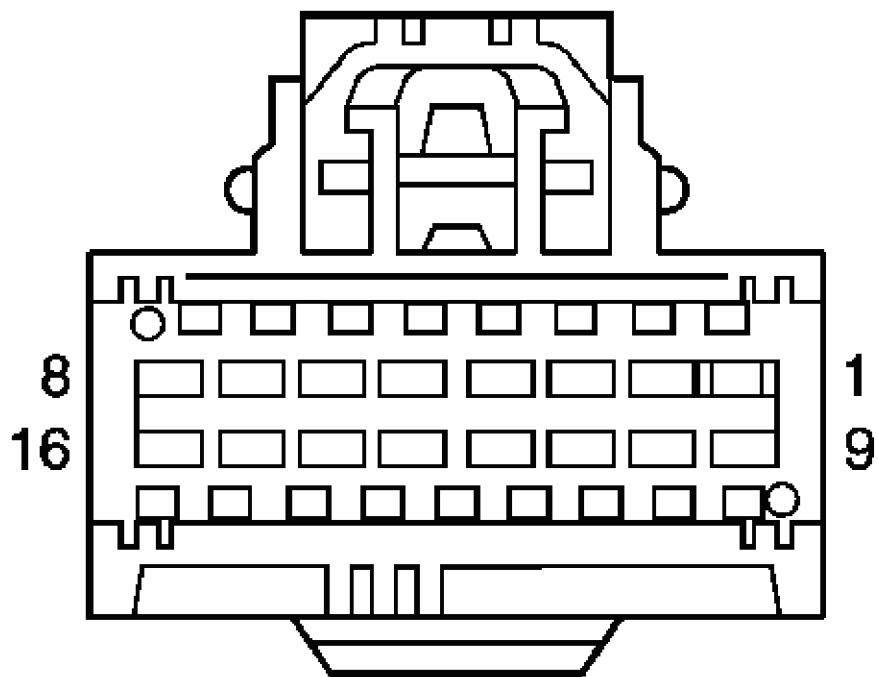


Fig. 17: Digital Radio Receiver (DRR) (U2K) Connector End View

Courtesy of GENERAL MOTORS CORP.

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Entertainment Connector End Views

Connector Part Information

- OEM: 7283-9076-30
- Service: 15136073
- Description: 16-Way F (BK)

Terminal Part Information

- Pins: 1, 2, 3, 4, 5, 9, 16
- Terminal/Tray: 7116-4618-02/14
- Core/Insulation Crimp: P/P
- Release Tool/Test Probe: J-38125-215/J-35616-64B (L-BU)

Digital Radio Receiver (DRR) (U2K)

Pin	Wire Color	Circuit No.	Function
1	TN/WH	372	Remote Radio Audio (-)
2	BN/WH	367	Remote Radio Left Audio Signal
3	GY	388	Remote Radio Right Audio Signal (2)
4	D-GN/WH	368	Remote Radio Right Audio Signal (1)
5	D-GN	5060	Low Speed GMLAN Serial Data
6-8	-	-	Not Used
9	BK	550	Ground
10-15	-	-	Not Used
16	PK/BN	2340	Battery Positive Voltage

Radio C1

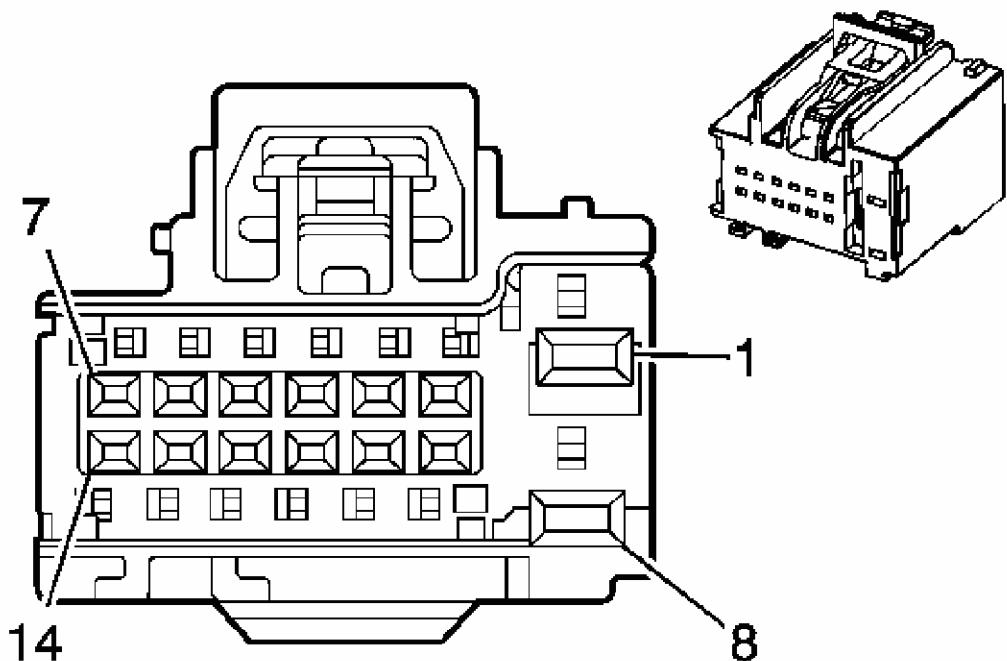


Fig. 18: Radio C1 Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 7283-4490-30
- Service: See Catalog
- Description: 14-Way F (BK)

Terminal Part Information

- Pins: 1, 8
- Terminal/Tray: 12191812/19
- Core/Insulation Crimp: C/A
- Release Tool/Test Probe: 15315247/J-35616-2A (GY)
- Pins: 2, 3, 4, 4, 5, 5, 6, 7, 9, 10, 11, 13, 14
- Terminal/Tray: 7116-4618-02/14
- Core/Insulation Crimp: P/P

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- Release Tool/Test Probe: J-38125-215/J-35616-64B (L-BU)

Radio C1

Pin	Wire Color	Circuit No.	Function
1	RD/WH	2040	Battery Positive Voltage
2	TN	511	Left Front Low Level Audio Signal
3	L-GN/WH	512	Right Front Low Level Audio Signal
4	GY/WH	655	Navigation Voice Signal (w/o UE1)
4	GY/BK	7043	Voice Recognition Audio Signal (U3U)
5	BK	1489	Drain Wire (w/o UE1)
5	PK/BK	7044	Voice Recognition Audio Low Reference (U3U)
6	PK	5165	Antenna 14-Volt Switched Supply Voltage
7	YE	1491	Backlight Lamp Control
8	BK	550	Ground
9	D-GN/RD	1947	Left Front Low Level Audio (-)
10	L-GN	1948	Right Front Low Level Audio (-)
11	BK/WH	1573	Front Audio Drain Wire
12	-	-	Not Used
13	D-GN	5060	Low Speed GMLAN Serial Data
14	D-GN	5060	Low Speed GMLAN Serial Data

Radio C2

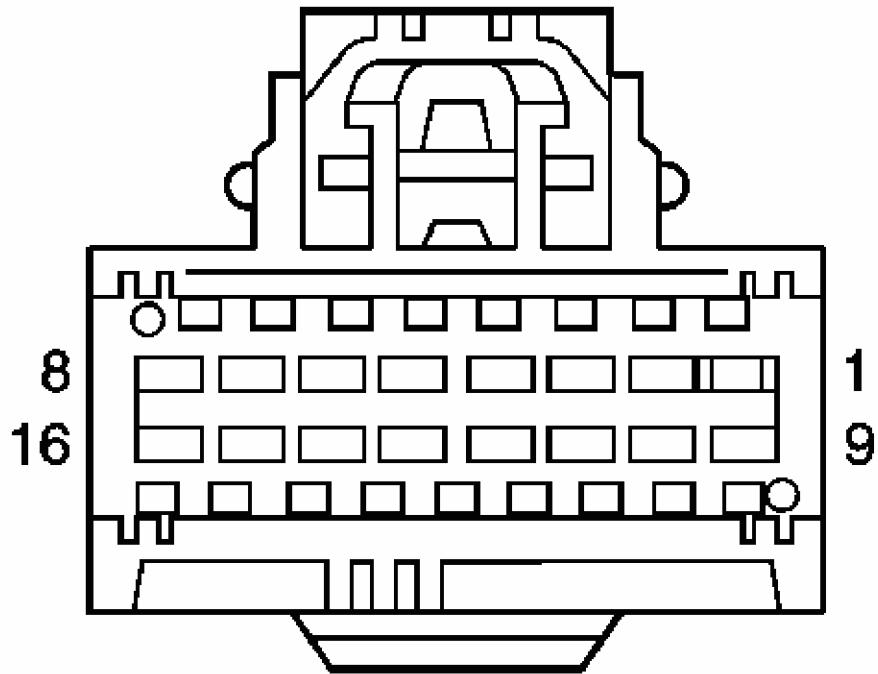


Fig. 19: Radio C2 Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 7283-9076-30
- Service: 15136073
- Description: 16-Way F (BK)

Terminal Part Information

- Pins: 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15
- Terminal/Tray: 7116-4618-02/14
- Core/Insulation Crimp: P/P
- Release Tool/Test Probe: J-38125-215/J-35616-64B (L-BU)

Radio C2

Pin	Wire Color	Circuit No.	Function

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1	BN/WH	367	Remote Radio Left Audio Signal
2	GY	388	Remote Radio Right Audio Signal (2)
3	BK/YE	1574	Rear Audio Drain Wire
4	-	-	Not Used
5	BN/WH	599	Left Rear Low Level Audio Signal
6	D-BU	546	Right Rear Low Level Audio Signal
7	OG/BK	1406	Remote Playback Device Left Audio Signal
8	PU	2334	Amplifier Control
9	TN/WH	372	Remote Radio Audio (-)
10	D-GN/WH	368	Remote Radio Right Audio Signal (1)
11	BK/TN	1705	Drain Wire
12	-	-	Not Used
13	BN	1999	Left Rear Low Level Audio (-)
14	TN/RD	1946	Right Rear Low Level Audio (-)
15	L-BU	1405	Remote Playback Device Audio Common Signal
16	-	-	Not Used

Radio C3 (U3U)

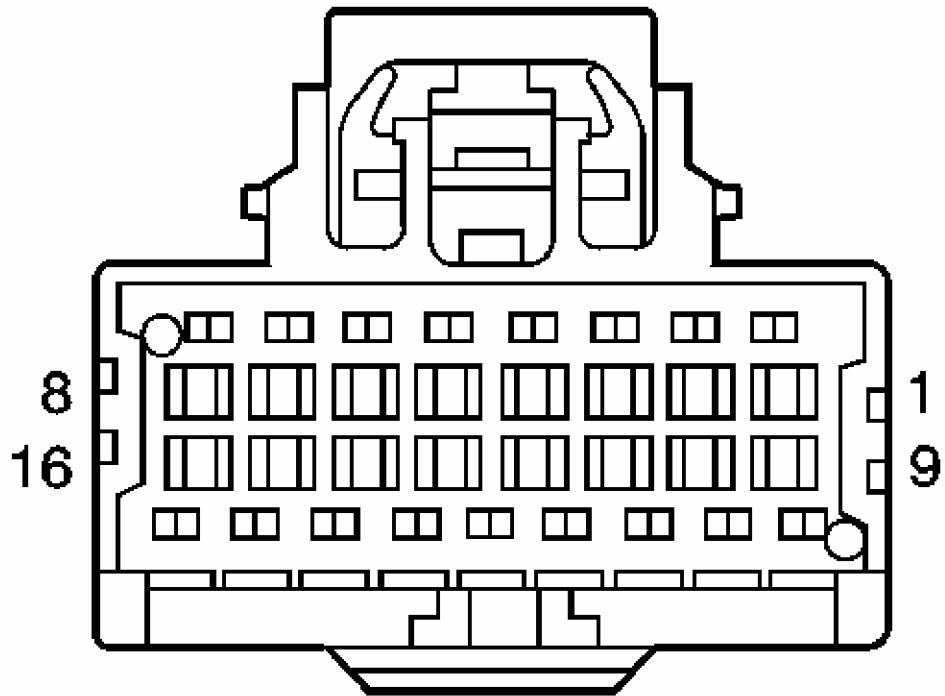


Fig. 20: Radio C3 (U3U) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 7283-9078-80
- Service: 15136074
- Description: 16-Way F (BN)

Terminal Part Information

- Pins: 5
- Terminal/Tray: 7116-4618-02/14
- Core/Insulation Crimp: P/P
- Release Tool/Test Probe: J-38125-215/J-35616-64B (L-BU)

Radio C3 (U3U)

Pin	Wire Color	Circuit No.	Function

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1-4	-	-	Not Used
5	D-GN/WH	817	Vehicle Speed Signal
6-16	-	-	Not Used

Radio Antenna Module

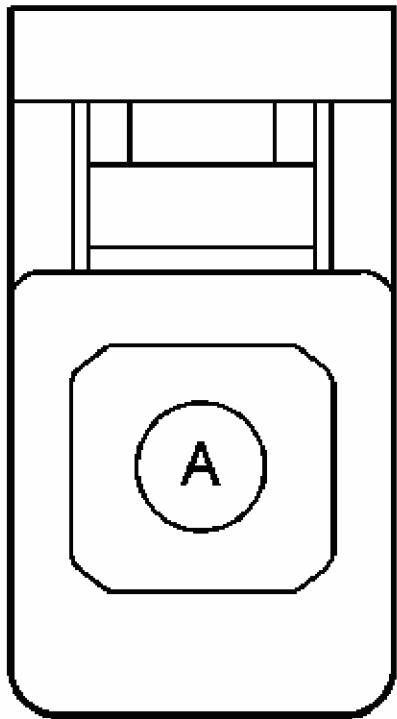


Fig. 21: Radio Antenna Module Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 172335-1
- Service: See Catalog
- Description: 1-Way F Mini Universal Mate-N-Lock (WH)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit

- Core/Insulation Crimp: See Terminal Repair Kit
- Connector Part Information
- Release Tool/Test Probe: See Terminal Repair Kit

Radio Antenna Module

Pin	Wire Color	Circuit No.	Function
A	PK	5165	Antenna 14-Volt Switched Supply Voltage

Speaker - Front Center (UQA)

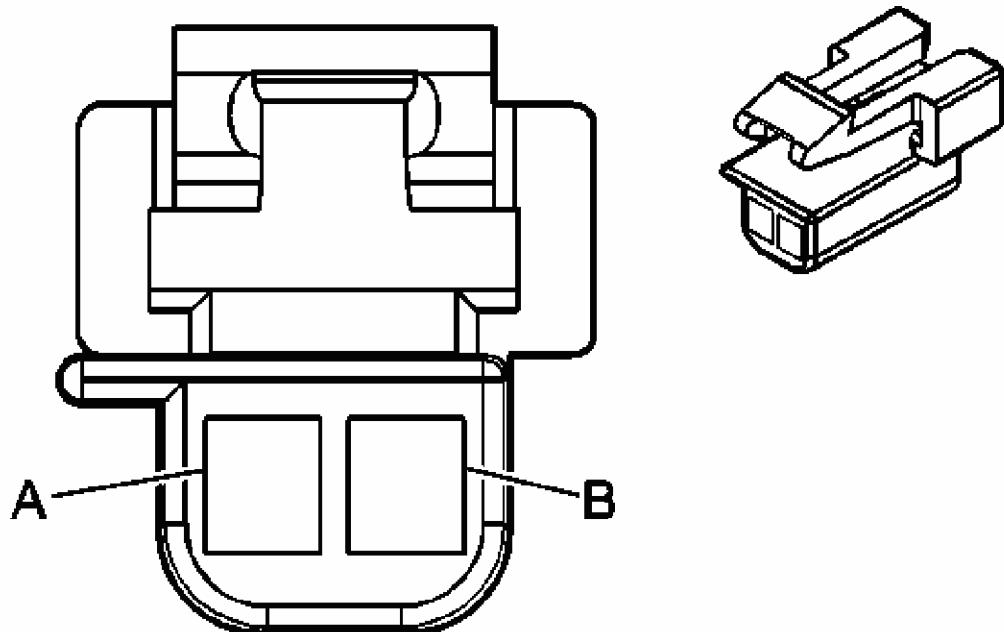


Fig. 22: Speaker - Front Center (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064869
- Service: 12117323
- Description: 2-Way F Metri-pack 150 Series (BU)

Terminal Part Information

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- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - Front Center (UQA)

Pin	Wire Color	Circuit No.	Function
A	L-BU	1960	Front Center Speaker (-)
B	YE	1860	Front Center Speaker (+)

Speaker - LF Door (UQ3)

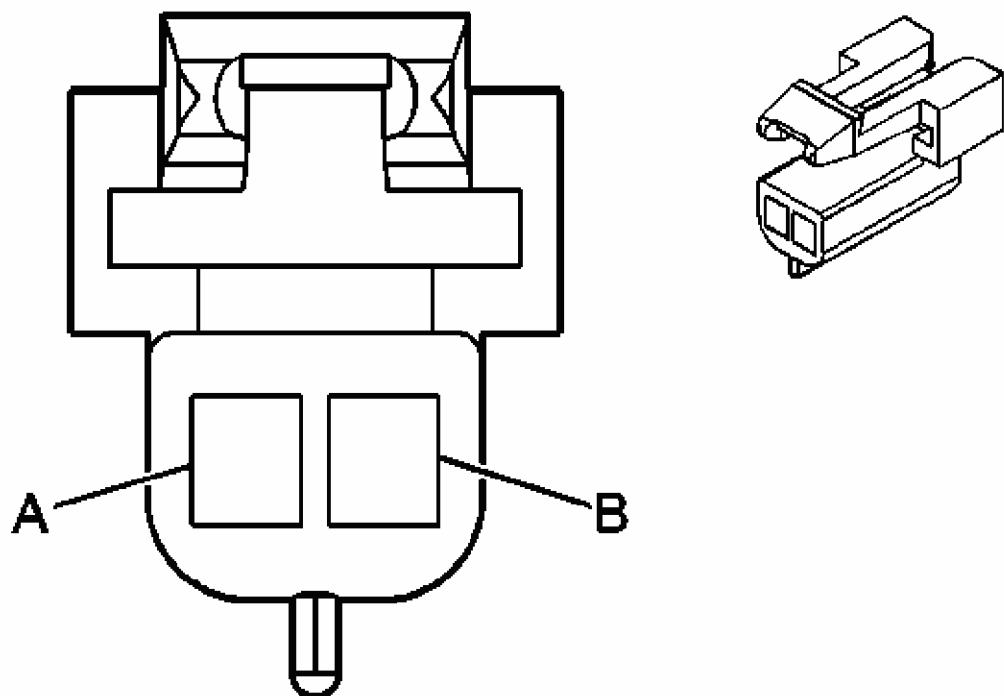


Fig. 23: Speaker - LF Door (UQ3) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12052832
- Service: 12101825

- Description: 2-Way F Metri-pack 150 Series (BK)

Terminal Part Information

- Terminal/Tray: 12064971/5
- Core/Insulation Crimp: E/C
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LF Door (UQ3)

Pin	Wire Color	Circuit No.	Function
A	GY	118	Left Front Speaker Signal (-)
B	TN	201	Left Front Speaker (+)

Speaker - LF Door (UQA)

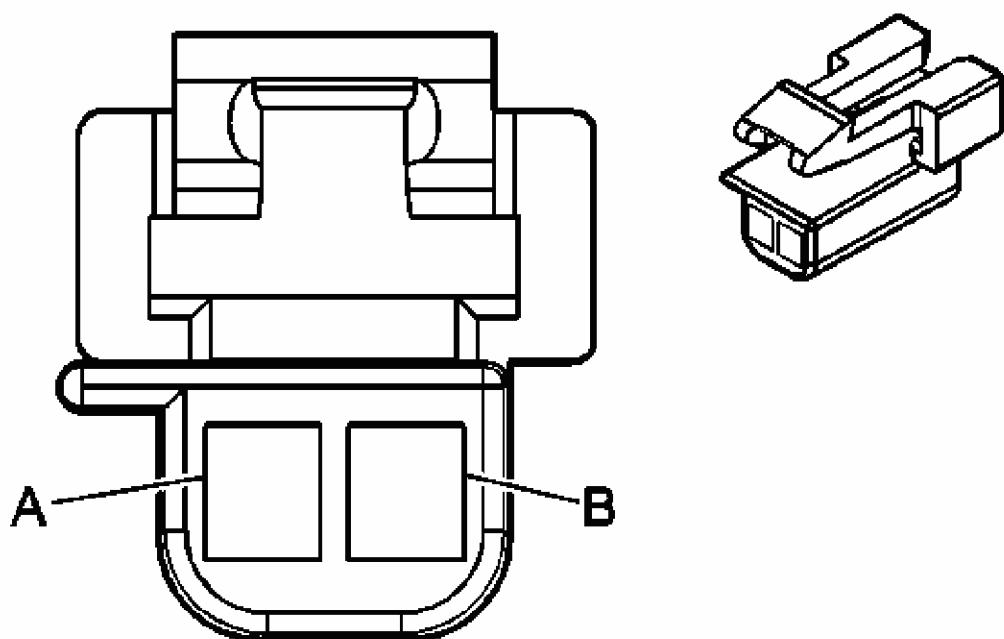


Fig. 24: Speaker - LF Door (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064869

- Service: 12117323
- Description: 2-Way F Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LF Door (UQA)

Pin	Wire Color	Circuit No.	Function
A	GY	118	Left Front Speaker Signal (-)
B	TN	201	Left Front Speaker (+)

Speaker - LF Tweeter (UQ3)

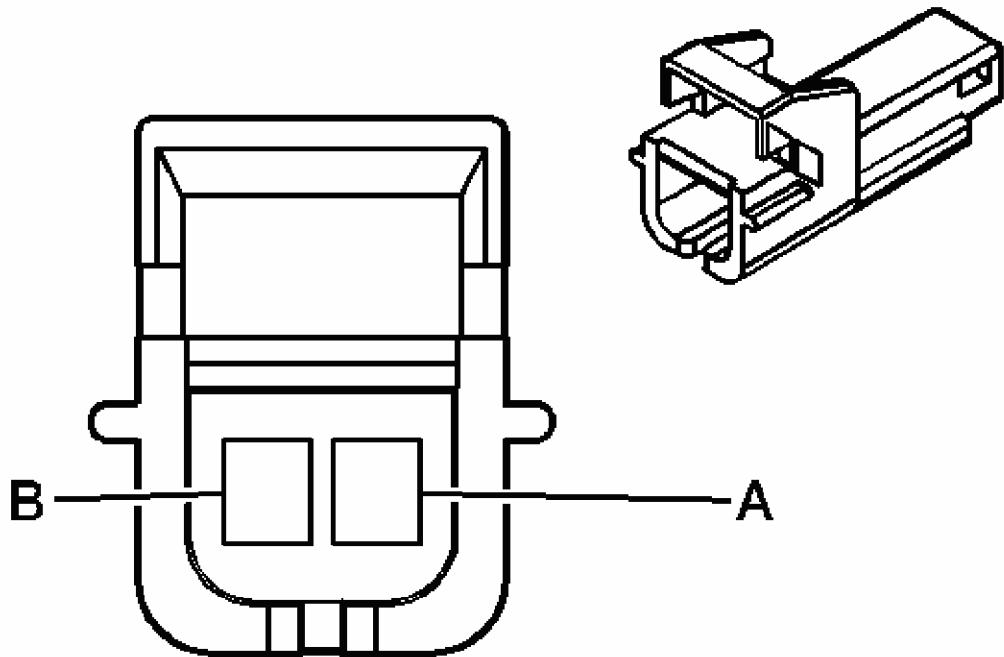


Fig. 25: Speaker - LF Tweeter (UQ3) Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12052833
- Service: 12117275
- Description: 2-Way M Metri-pack 150 Series (BK)

Terminal Part Information

- Terminal/Tray: 12047581/2
- Core/Insulation Crimp: E/C
- Release Tool/Test Probe: 12094429/J-35616-3 (GY)

Speaker - LF Tweeter (UQ3)

Pin	Wire Color	Circuit No.	Function
A	GY	118	Left Front Speaker Signal (-)
B	TN	201	Left Front Speaker Signal (+)

Speaker - LF Tweeter (UQA)

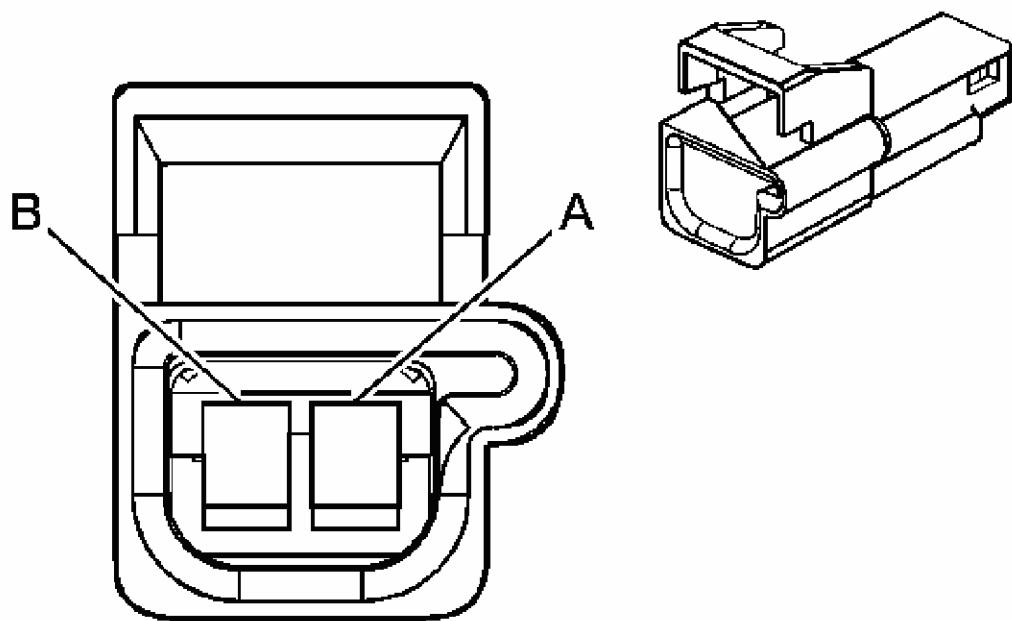


Fig. 26: Speaker - LF Tweeter (UQA) Connector End View
Courtesy of GENERAL MOTORS CORP.

Connector Part Information

- OEM: 12064870
- Service: See Catalog
- Description: 2-Way M Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Speaker - LF Tweeter (UQA)

Pin	Wire Color	Circuit No.	Function
A	GY	118	Left Front Speaker Signal (-)
B	TN	201	Left Front Speaker (+)

Speaker - LR Door (UQA)

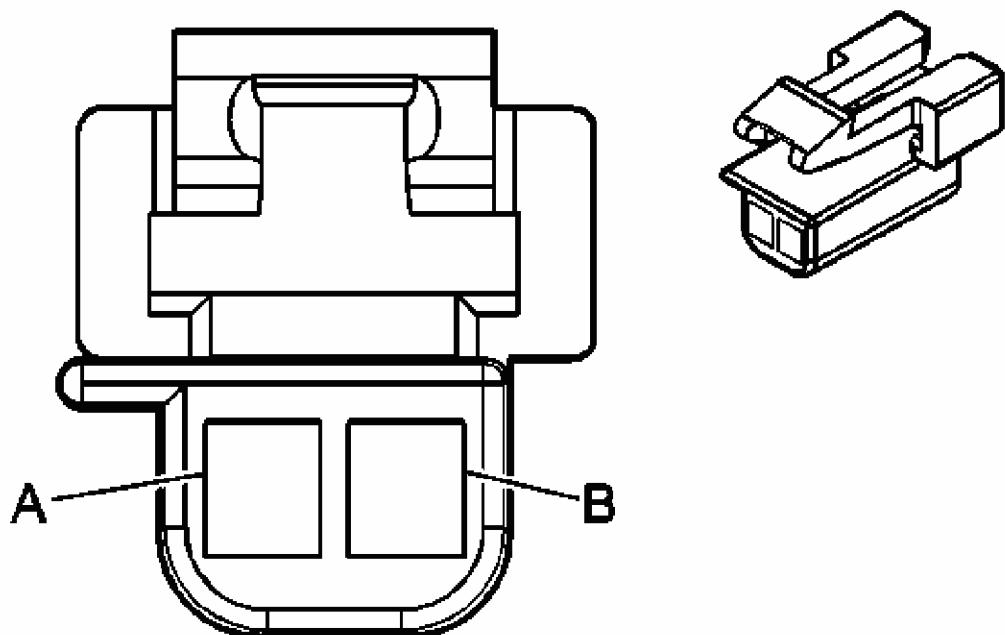


Fig. 27: Speaker - LR Door (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064869
- Service: 12117323
- Description: 2-Way F Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LR Door (UQA)

Pin	Wire Color	Circuit No.	Function
A	WH	1959	Left Rear Midrange Speaker (-)
B	TN/OG	1859	Left Rear Midrange Speaker (+)

Speaker - LR (UQ3)

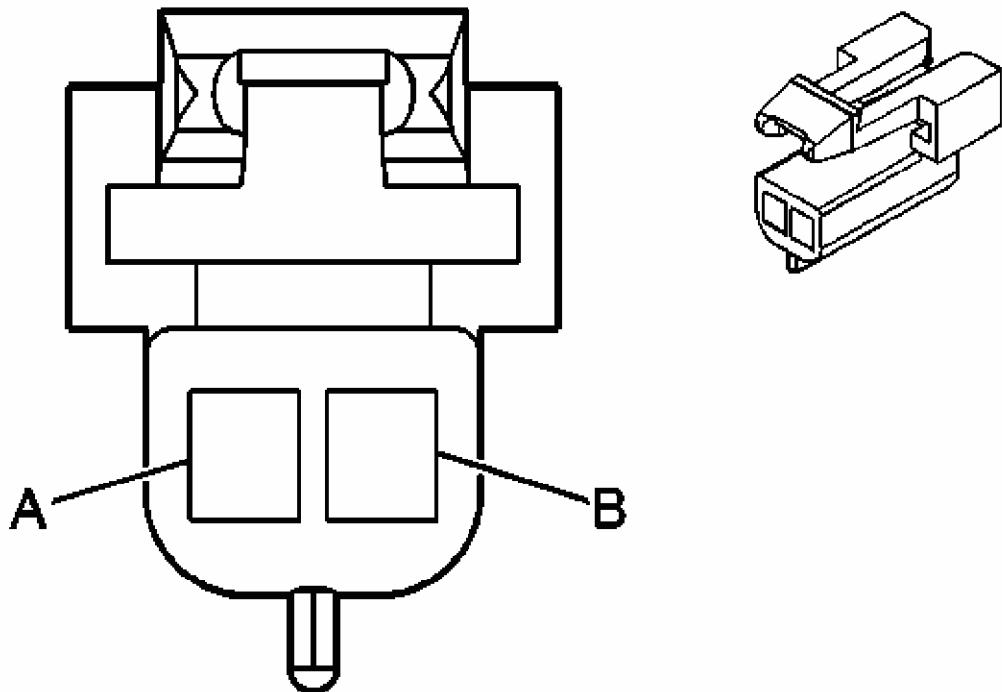


Fig. 28: Speaker - LR (UQ3) Connector End View
Courtesy of GENERAL MOTORS CORP.**Entertainment Connector End Views****Connector Part Information**

- OEM: 12052832
- Service: See Catalog
- Description: 2-Way F Metri-pack 150 Series (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LR (UQ3)

Pin	Wire Color	Circuit No.	Function
A	YE	116	Left Rear Midrange Speaker (-)
B	BN	199	Left Rear Midrange Speaker (+)

Speaker - LR (UQA)

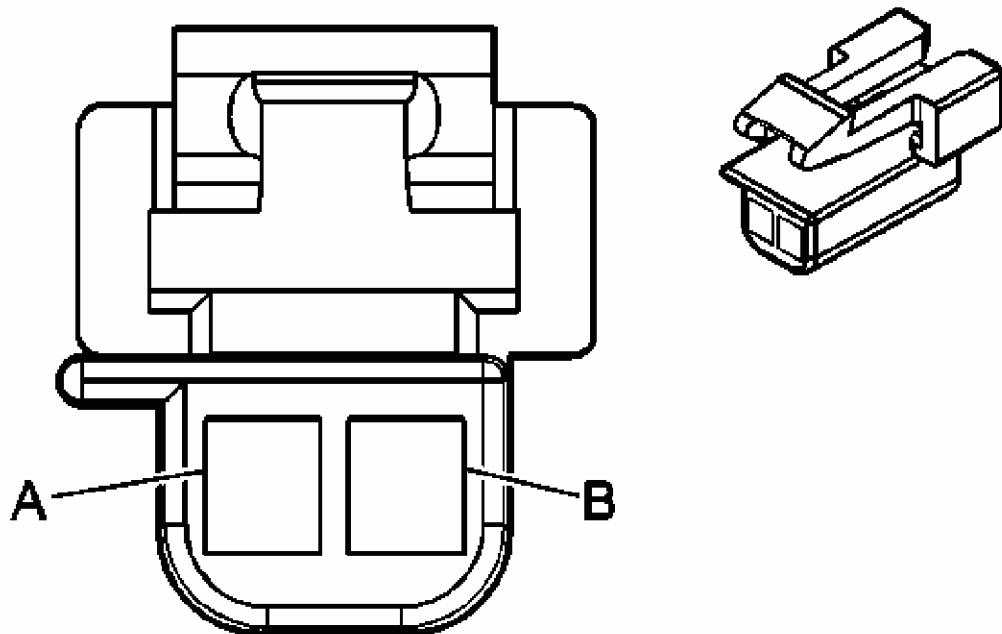


Fig. 29: Speaker - LR (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064869
- Service: 12117323
- Description: 2-Way F Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - LR (UQA)

Pin	Wire Color	Circuit No.	Function
A	D-BU/WH	5771	Left Rear Speaker Signal (-)
B	D-BU	5761	Left Rear Speaker Signal (+)

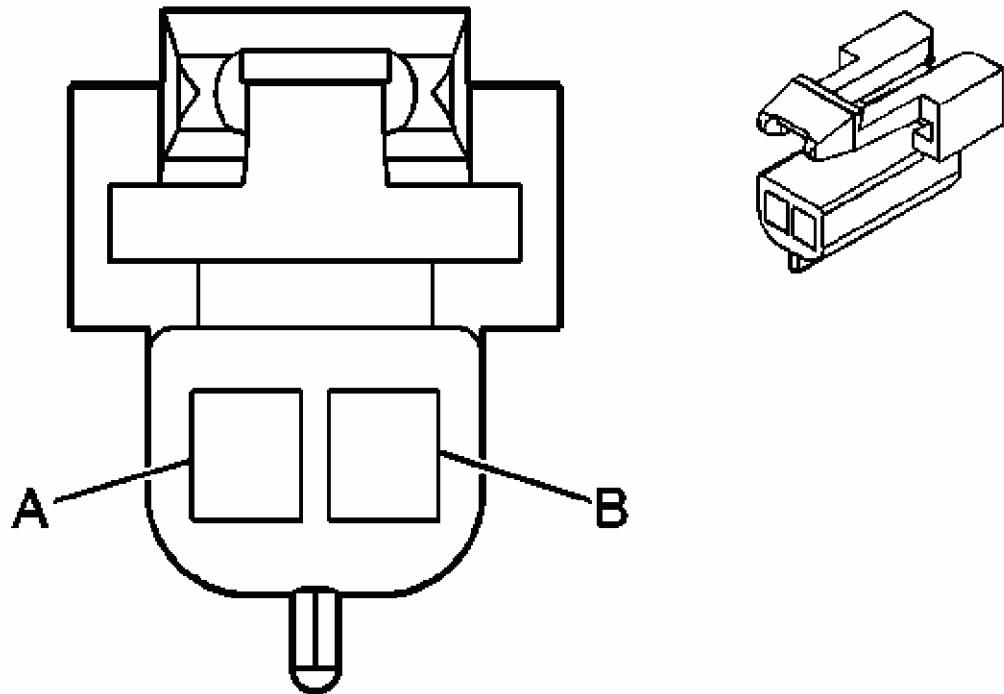
Speaker - RF Door (UQ3)

Fig. 30: Speaker - RF Door (UQ3) Connector End View
Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views**Connector Part Information**

- OEM: 12052832
- Service: 12101825
- Description: 2-Way F Metri-pack 150 Series (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RF Door (UQ3)

Pin	Wire Color	Circuit No.	Function

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A	PK/BK	117	Right Front Speaker Signal (-)
B	L-GN	200	Right Front Speaker (+)

Speaker - RF Door (UQA)

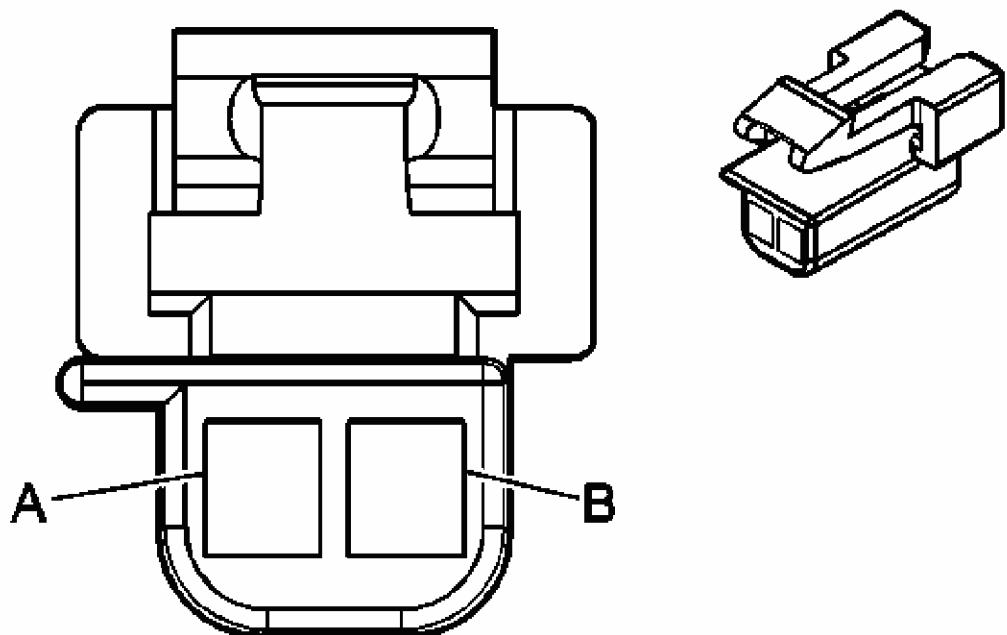


Fig. 31: Speaker - RF Door (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064869
- Service: 12117323
- Description: 2-Way F Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RF Door (UQA)

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Pin	Wire Color	Circuit No.	Function
A	PK/BK	117	Right Front Speaker Signal (-)
B	L-GN	200	Right Front Speaker (+)

Speaker - RF Tweeter (UQ3)

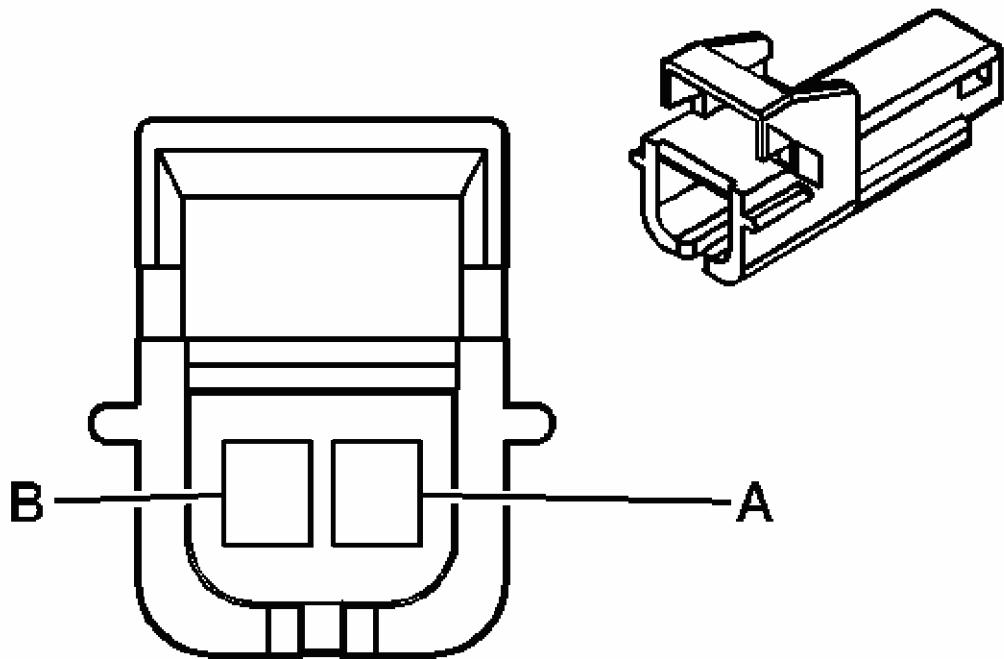


Fig. 32: Speaker - RF Tweeter (UQ3) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12052833
- Service: 12117275
- Description: 2-Way M Metri-pack 150 Series (BK)

Terminal Part Information

- Terminal/Tray: 12047581/2
- Core/Insulation Crimp: E/C
- Release Tool/Test Probe: 12094429/J-35616-3 (GY)

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Speaker - RF Tweeter (UQ3)

Pin	Wire Color	Circuit No.	Function
A	PK/BK	117	Right Front Tweeter Speaker (-)
B	L-GN	200	Right Front Tweeter Speaker (+) (Early Production)
	L-GN/BK	200	Right Front Tweeter Speaker (+) (Late Production)

Speaker - RF Tweeter (UQA)

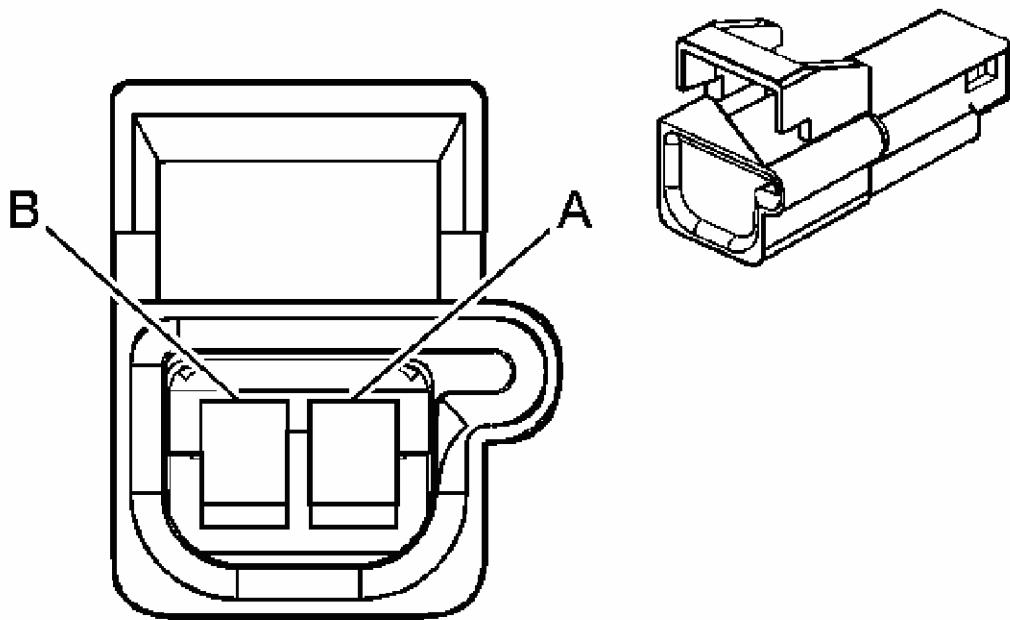


Fig. 33: Speaker - RF Tweeter (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12064870
- Service: See Catalog
- Description: 2-Way M Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Speaker - RF Tweeter (UQA)

Pin	Wire Color	Circuit No.	Function
A	PK/BK	117	Right Front Speaker Signal (-)
B	L-GN	200	Right Front Speaker (+) (Early Production)
	L-GN/BK	200	Right Front Speaker (+) (Late Production)

Speaker - RR Door (UQA)

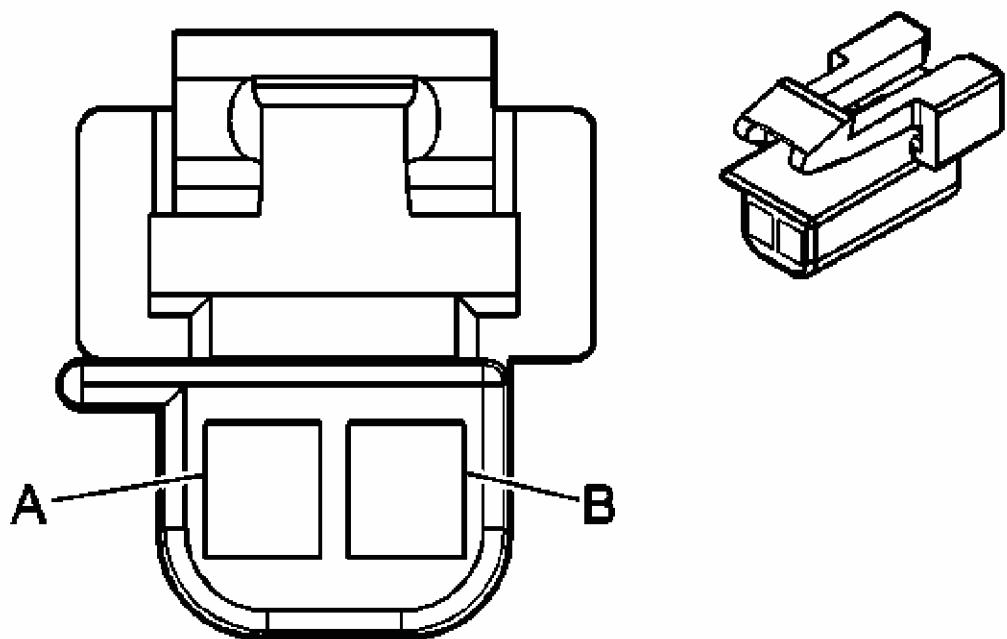


Fig. 34: Speaker - RR Door (UQA) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

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- OEM: 12064869
- Service: 12117323
- Description: 2-Way F Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RR Door (UQA)

Pin	Wire Color	Circuit No.	Function
A	OG	1955	Right Rear Midrange Speaker (-)
B	TN/BK	1855	Right Rear Midrange Speaker (+)

Speaker - RR (UQ3)

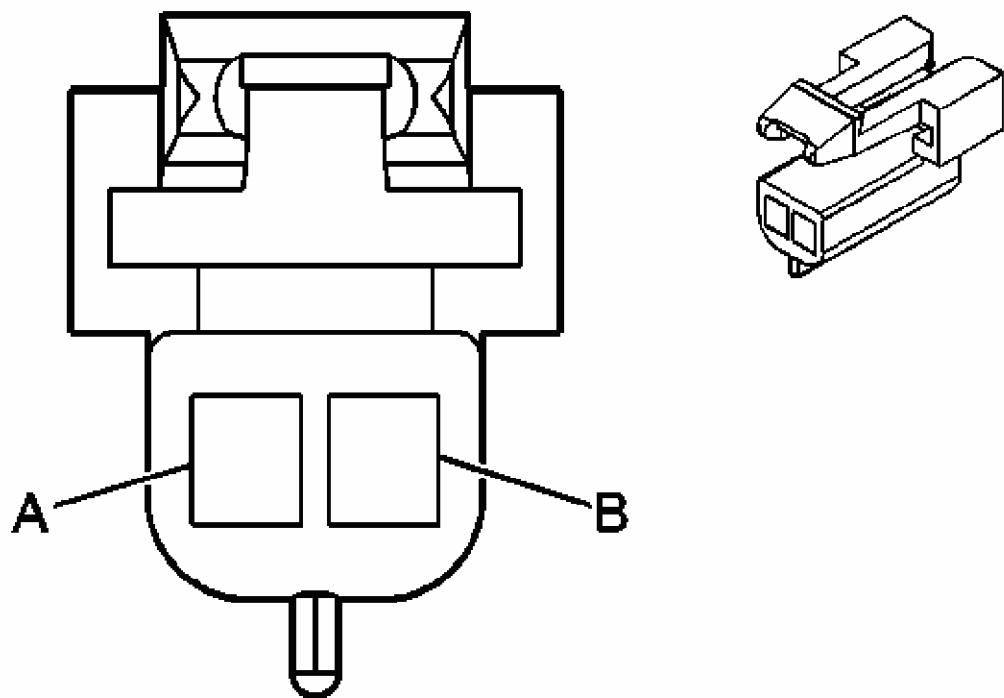


Fig. 35: Speaker - RR (UQ3) Connector End View

Courtesy of GENERAL MOTORS CORP.

Entertainment Connector End Views

Connector Part Information

- OEM: 12052832
- Service: See Catalog
- Description: 2-Way F Metri-pack 150 Series (BK)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RR (UQ3)

Pin	Wire Color	Circuit No.	Function
A	L-BU	115	Right Rear Midrange Speaker (-)
B	D-BU	46	Right Rear Midrange Speaker (+)

Speaker - RR (UQA)

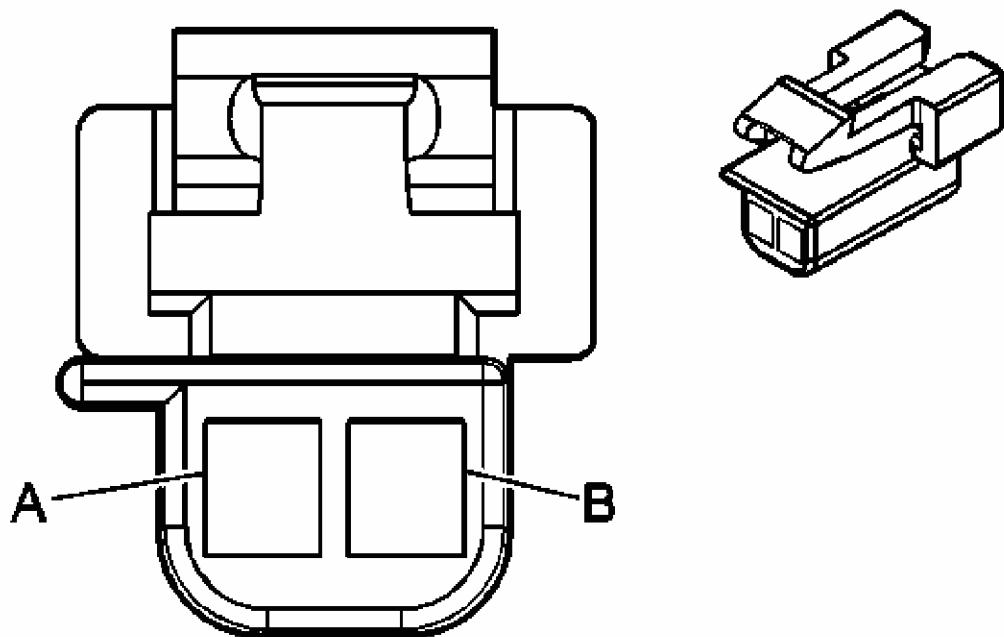


Fig. 36: Speaker - RR (UQA) Connector End View

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Courtesy of **GENERAL MOTORS CORP.**

Entertainment Connector End Views

Connector Part Information

- OEM: 12064869
- Service: 12117323
- Description: 2-Way F Metri-pack 150 Series (BU)

Terminal Part Information

- Terminal/Tray: 12047767/2
- Core/Insulation Crimp: E/A
- Release Tool/Test Probe: 12094429/J-35616-2A (GY)

Speaker - RR (UQA)

Pin	Wire Color	Circuit No.	Function
A	L-BU/BK	5772	Right Rear Speaker Signal (-)
B	L-BU	5762	Right Rear Speaker Signal (+)

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B1025, B1035, B1045 or B1055	** MULTIPLE VALUES **
DTC B1259	**DESCRIPTION NOT COLLECTED **
DTC B1287	**DESCRIPTION NOT COLLECTED **

DIAGNOSTIC STARTING POINT - ENTERTAINMENT

Begin the system diagnosis with the **Diagnostic System Check - Vehicle** in Vehicle DTC Information. The Diagnostic System Check - Vehicle will provide the following information:

- The identification of the control modules which command the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored DTCs and their status

The use of the Diagnostic System Check - Vehicle will identify the correct procedure for diagnosing the system and where the procedure is located.

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SCAN TOOL OUTPUT CONTROLS**Bose Amplifier Scan Tool Output Control**

Scan Tool Output Control	Description
Center I/P Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Left Front Door Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Left Front Tweeter Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Left Rear D-Pillar Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Left Rear Door Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Rear Subwoofer	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Right Front Door Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Right Front Tweeter Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Right Rear Door Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
	Commanding the speaker ON will turn off all speakers except this speaker.

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Right Rear D-Pillar Speaker	Commanding the speaker OFF will turn off all speakers.
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Radio Scan Tool Output Control

Scan Tool Output Control	Description
Left Front Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Right Front Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Left Rear Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.
Right Rear Speaker	Commanding the speaker ON will turn off all speakers except this speaker. Commanding the speaker OFF will turn off all speakers.

SCAN TOOL DATA LIST

Radio

Operating Conditions: Ignition ON/Engine OFF/Radio ON			
Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
End Model Part Number	Module Information	Numeric	Varies
Base Model Part Number	Module Information	Numeric	Varies
Julian Date of Build	Module Information	Numeric	Varies
Software Part Number	Module Information	Numeric	Varies
Year Module Built	Module Information	Numeric	Varies
Component Serial No. 13-16	Module Information	Numeric	Varies
CD S.W. Level	CD/DVD/Map	-	-

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	Information		
CD H.W. Level	CD/DVD/Map Information	-	-
DVD H/W Part Number	CD/DVD/Map Information	Numeric	-
DVD S/W Part Number	CD/DVD/Map Information	Numeric	-
Navigation Software Version	CD/DVD/Map Information	-	-
Navigation Hardware Level	CD/DVD/Map Information	-	-
Antenna Module	Data	Enabled/Disabled	Enabled
Auxiliary Video Input	Data	Present/Not Present	Varies
Battery Voltage Signal	Data	Numeric	Varies
DRR	Data	Present/Not Present	Varies
Ign. Cycles Since Last	Data	Numeric	Varies
Phone Signal	Data	Present/Not Present	Varies
Power Mode	Data	Off/Accessory/Run/Crank Request	Run
Power Mode Config.	Data	Bench/Normal Mode	Normal
Signal Strength	Data	Numeric	19
Theft Armed	Data	No VIN/Learned VIN	Learned VIN
Theft Lock Status	Data	Active/Inactive	Inactive
Video Display	Data	Present/Not Present	Varies

Digital Radio Receiver

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Radio ON			
Battery Voltage	Data	Volts	Varies
Ignition Counter	Data	Numeric	Varies
Power Mode	Data	Alphanumeric	Run

Amplifier (Bose)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Radio ON			
End Model Part Number	Module Information	Numeric	Varies

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Base Model Part Number	Module Information	Numeric	Varies
Software Part Number	Module Information	Numeric	Varies
Year Module Built	Module Information	Numeric	Varies
Julian Date of Build	Module Information	Numeric	Varies
Component Serial No. 13-16	Module Information	Numeric	Varies
Battery Voltage	Data	Volts	Varies
Calculated System Temperature	Data	Celsius	30

SCAN TOOL DATA DEFINITIONS

Base Model Part Number

Information used during SPS programming to identify a unique combination of ECU hardware and all non-reprogrammable software (e.g. Boot software).

Battery Voltage Signal

The scan tool displays 0-25.5 volts. The displayed value is calculated from a circuit connected to source voltage.

CD H/W Level

The scan tool displays a numeric value that represents the hardware level the internal CD Changer contains.

CD S/W Level

The scan tool displays a numeric value that represents the software level the internal CD Changer contains.

Component Serial No. 13-16

The scan tool displays a numeric value that represents the modules serial number.

Digital Radio Antenna

The scan tool displays millivolts. This parameter indicates the amount of current being

used by the digital radio antenna by measuring the voltage drop across an internal resistor. Typical value is 1200-1800 mV.

DRR

The scan tool displays Present/Not Present. The scan tool displays Present when the digital radio receiver (DRR) is connected to the radio.

End Model Part Number

Part number used in service to uniquely identify the combination of hardware/software/calibrations programmed into the ECU at the time the part is ordered.

Julian Date of Build

The scan tool displays 0-999. This represents the day of year the module was manufactured.

Phone Signal

The scan tool displays Present/Not Present. The scan tool displays Present when a phone is connected.

Power Mode

The scan tool displays what power mode the module is in.

Power Mode Config

The diagnostic state the radio is in.

Radio Signal Strength

The scan tool displays 0-300. The signal from the antenna is measured in dBuV.

Theft Armed

The scan tool displays Learned VIN/No VIN. The scan tool displays Learned VIN indicating the radio received a valid VIN.

Theft Lock Status

The scan tool displays Active/Inactive. The scan tool displays Inactive, indicating the radio received the correct VIN and the Theft Lock Mode is not enabled.

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DTC B1025, B1035, B1045 OR B1055

DTC Descriptors

DTC B1025 01

Audio Output 1 Left Front Circuit Short to Battery

DTC B1025 02

Audio Output 1 Left Front Circuit Short to Ground

DTC B1025 04

Audio Output 1 Left Front Circuit Open

DTC B1035 01

Audio Output 2 Right Front Circuit Short to Battery

DTC B1035 02

Audio Output 2 Right Front Circuit Short to Ground

DTC B1035 04

Audio Output 2 Right Front Circuit Open

DTC B1045 01

Audio Output 3 Left Rear Circuit Short to Battery

DTC B1045 02

Audio Output 3 Left Rear Circuit Short to Ground

DTC B1045 04

Audio Output 3 Left Rear Circuit Open

DTC B1055 01

Audio Output 4 Right Rear Circuit Short to Battery

DTC B1055 02

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Audio Output 4 Right Rear Circuit Short to Ground

DTC B1055 04

Audio Output 4 Right Rear Circuit Open

Diagnostic Fault Information

IMPORTANT: Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B1025, B1035, B1045 or B1055

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Speaker Signal Circuits (Front Door and Tweeter)	B1025 02	B1025 04	B1025 01	-
Right Front Speaker Signal Circuits (Front Door and Tweeter)	B1035 02	B1035 04	B1035 01	-
Left Midrange Speaker Signal Circuits (Rear Door)	B1045 02	B1045 04	B1045 01	-
Right Midrange Speaker Signal Circuits (Rear Door)	B1055 02	B1055 04	B1055 01	-

Circuit/System Description

The up-level radio (UQA) supplies 4 channels of audio to an amplifier. The amplifier supplies 4 input signal channels to 6 speakers.

Conditions for Running the DTC

The radio is ON.

Conditions for Setting the DTC

The radio sets a current status for this DTC when a short to ground, short to voltage or an open is detected on any of the 4 speaker channel outputs from the radio.

Action Taken When the DTC Sets

No sound is present from one or more of the speakers.

Conditions for Clearing the DTC

The fault condition is not present for 0.25 second.

Diagnostic Aids

Speakers located in the front A-pillar are connected to the same channel as the speaker in the door. A DTC will only set after the amplifier only on up-level radios.

Reference Information**Schematic Reference****Radio/Audio System Schematics****Connector End View Reference****Entertainment Connector End Views****Electrical Information Reference**

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference**Scan Tool Data List****Circuit/System Verification**

All speakers should function properly and make sure the DTC does not reset.

Circuit/System Testing

Test the suspect speaker channel (after the amplifier) for a short to ground, short to voltage or an open.

- If a short to ground or voltage can not be found, replace the amplifier.

Repair Procedures

IMPORTANT: Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Speaker Replacement Reference

- Control Module References for radio replacement, setup and programming

DTC B1259

DTC Descriptor

DTC B1259

Antenna Ground Circuit

Diagnostic Fault Information

Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B1259

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Antenna Signal	1	1	1	-
1. Sets code B1259				

Circuit/System Description

The antenna signal circuit is a coaxial cable that carries the radio signal information received by the antenna. The antenna cable also provides a path for DC current for powering the antenna.

Conditions for Running the DTC

This test is run every 300 milliseconds.

Conditions for Setting the DTC

The digital radio receiver (DRR) detects an antenna fault.

Action Taken When the DTC Sets

The radio displays "No XM Signal" or "Check Antenna"

Conditions for Clearing the DTC

- The condition must be corrected.
- The DTC clears after 100 malfunction-free ignition cycles.

Reference Information

Schematic Reference

Radio/Audio System Schematics

Connector End View Reference

Entertainment Connector End Views

Description and Operation

Radio/Audio System Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Special Tools Required

EL-48028 Digital Radio Test Antenna. See **Special Tools**.

Circuit/System Testing

1. Ignition OFF, disconnect the antenna coax from the DRR. Connect the test antenna to the DRR.
 2. Turn the ignition ON, radio ON tuned to XM. Verify that DTC B1259 is not current.
 - If the DTC B1259 is still current, replace the DRR.
 3. Ignition is OFF. Disconnect the DRR antenna from the coaxial cable. Test the resistance of the antenna coaxial cable center conductor from end to end. Verify the resistance is less than 5 ohms.
 - If the resistance is greater than 5 ohms, replace the antenna coaxial cable.
 4. Test the resistance of the antenna coaxial cable outer shield from end to end. Verify the resistance is less than 5 ohms.
 - If the resistance is greater than 5 ohms, replace the antenna coaxial cable.
 5. Test the resistance of the antenna coaxial cable between the center conductor and the outer conductor. Verify there is infinite resistance between both conductors.
 - If there is less than infinite resistance between the inner conductor and the outer conductor of the coaxial cable, replace the antenna coaxial cable. If the coaxial cable tests normal, replace the digital radio antenna.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- Digital Radio Antenna Cable Replacement
- Cellular Communications/Digital Radio Antenna Replacement
- Digital Radio Receiver Replacement

DTC B1287**DTC Descriptors****DTC B1287 01**

Amplifier Control Signal Circuit Short to Battery

DTC B1287 02

Amplifier Control Signal Circuit Short to Ground

DTC B1287 04

Amplifier Control Signal Circuit Open

Diagnostic Fault Information

IMPORTANT: Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.

DTC B1287

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Amp Control	2	2	1	-
1. No audio output. 2. Four Channel unmute, possible noise in speakers when radio muted or turned OFF.				

Circuit/System Description

The radio provides a remote amp mute output circuit to control overall muting of remote non-GMLAN amplifiers with rear seat audio (RSA) applications. The amplifier receives pulse width modulated (PWM) signals on the circuit at varying duty cycle percentages for controlling the muted and unmuted functions of the amplifier. The RSA enable circuit in the radio enables the rear seat channel muting of the amplifier. A diagnostic sense circuit internal to the radio monitors the remote amp mute circuit for faults and sets the appropriate DTC when detected.

Conditions for Running the DTC

The following are conditions that must be present in order for the radio to enable the diagnostics.

- The radio is in ACCESSORY, RUN or RAP power mode.
- The system voltage is at least 9 volts and no more than 16 volts.

Conditions for Setting the DTC

Circuit failure 400 ms after radio activates Remote Enable.

Action Taken When the DTC Sets

Radio sets the DTC and continues to output correct state.

Conditions for Clearing the DTC

- The condition must be corrected.
- A history DTC clears after 100 malfunction-free ignition cycles.
- The radio receives the clear code command from the scan tool.

Reference Information**Schematic Reference****Radio/Audio System Schematics****Connector End View Reference****Entertainment Connector End Views****Electrical Information Reference**

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Circuit/System Verification

Verify the audio system performance by adjusting the fade and balance of the speaker outputs.

Circuit/System Testing

Ignition OFF, test the remote radio control signal circuit for an open, a short to voltage or a short to ground.

- If the circuit tests normal, replace the radio.

Repair Procedures

IMPORTANT: Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Radio Replacement

SYMPTOMS - ENTERTAINMENT

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Perform the **Diagnostic System Check - Vehicle** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions.
Refer to **Radio/Audio System Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the radio. Refer to **Checking Aftermarket Accessories**.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections**.

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Audio System Troubleshooting Hints**
- **Radio Poor Reception**
- **Digital Radio Poor or No Reception**
- **Audio Distortion - One or More Speakers**
- **Noise Compensated Volume Inoperative**

- **Reduced Volume - One or More Speakers**
- **Speakers Inoperative - One or More**
- **Speakers Inoperative - All**

For navigation related symptoms, refer to **Symptoms - Navigation Systems**.

AUDIO SYSTEM TROUBLESHOOTING HINTS

Many conditions that affect radio operation may be corrected without removing the radio from the car. Verify the condition and follow the diagnostic procedures in order to isolate and correct the condition. In order to properly diagnose any audio system problems, ensure that you have a fully charged battery.

Preliminary Inspections

IMPORTANT: When testing the audio system for poor reception or noise, the vehicle should be outside away from metal buildings and utility lines, with the hood and rear compartment closed.

- Check for any aftermarket equipment that may have been installed on the vehicle. If aftermarket equipment is found disconnect it and check if the audio noise is still present.

Inspect that the antenna connector and the antenna coaxial cable are clean and tight.

- For reception concerns, first determine if the customer is within the listening area of the stations they are attempting to receive.
- Stations at the lower end of the FM band are more susceptible to audio noises than stations at the higher end.
- If the noise is only from one speaker check for the following before speaker replacement:
 - Isolate the noise using the **J 39916-A** CD and Cassette Diagnostic Audio Kit. See **Special Tools**.
 - Inspect the speaker connections to ensure they are clean and tight. Refer to **Testing for Intermittent Conditions and Poor Connections**.
 - Inspect for a loose or incorrectly installed speaker or surrounding trim. Loose trim can cause a buzz or flutter which sounds like a malfunctioning speaker.
- Ignition noise on the FM band may be an indication of an ignition system problem.
- Inspect that all vehicle grounds are clean, tight and free of corrosion.
- Inspect the rear defogger grid lines for large breaks or dark spots.
- Inspect the connections at the radio antenna module to ensure that they are clean and tight.

- Compare the customers vehicle to another of similar model and audio system to determine if the condition is abnormal.

Identifying Concerns

1. In order to isolate the source of the noise/poor reception, identify the ignition switch position that the concern is most noticeable:
 1. Turn the ignition switch to the accessory position.
 2. Turn ON the radio.
 3. Seek up 88-108 FM then 550-1600 AM.
 4. Record the number of valid radio stations where the tuner stops.
 5. Repeat these steps with the ignition ON and the engine OFF then again with the engine running.
2. Return the ignition switch to the position that the concern was most noticeable.
3. Remove fuses or circuit breakers one at a time until the noise has been eliminated.
4. Identify what systems or components are powered by the fuse.
5. Reinstall all fuses and circuit breakers.
6. Disconnect the components powered by the fuse one at a time until the concern has been eliminated.

Corrective Action

- Inspect the ground integrity of the component or system causing the noise.
- Malfunctioning and marginal components such as relays and solenoids may cause noise and/or poor reception.
- Always use a braided ground strap when applying additional grounds and keep the ground strap as short as possible.
- If the noise source is found to be coming from the vehicle harness:
 - Route the antenna cable separately from the wire harness that is emitting the noise.
 - Use aluminum or nickel tape in order to shield the antenna cable. Attempt variations of the following repairs:
 - Add only aluminum or nickel tape before adding a ground strap to the tape.
 - Wrap a ground strap 360 degrees around the tape, securing the other end of the strap to chassis ground.

IMPORTANT: When installing suppression devices, signal wires such as sensor and communication circuits should not be suppressed. Battery and ignition voltage circuits are the best choices for suppressing.

- Capacitors work best on switch pops and low frequency noise.
- Filters work best on high frequency whines and static.
- After adding any suppression device, inspect all of the vehicle systems for proper operation and function.
- Whenever possible, make a test harness that includes filters or capacitors. Always inspect the effectiveness and operation before permanent installation.
- If an audible pop is caused due to operating a switch, perform the following repairs as necessary:
 - Add a capacitor across the contacts of the switch.
 - Add a capacitor from the battery positive voltage (B+) side of the switch to chassis ground.
 - Add a capacitor from the ground side of the switch to chassis ground.
- Use the following available noise suppression devices:
 - 220 micro farad (50 V) capacitor GM P/N 1227895-Works well for ignition system related noise.
 - 0.47 micro farad capacitor GM P/N 1227894-Works well for switches and relays.
 - Feed through capacitor GM P/N 477371-Works well for high current situations.
 - Filter package GM P/N 1224205-Works well for low current situations.
 - Fuel pump suppressor GM P/N 25027405
 - 53.34 cm (21 in) braided ground strap GM P/N 8910791
 - 48.26 cm (19 in) braided ground strap GM P/N 6286800
 - 26.67 cm (10.5 in) braided ground strap GM P/N 6287160
 - 21.59 cm (8.5 in) braided ground strap GM P/N 12091511

Generator Whine Concerns

1. Inspect the ground terminal and cable for high resistance.
2. Inspect the generator and brackets for loose or coated mounting bolts.
3. Inspect that the ground straps between the engine and the frame are clean and tight.
4. If the noise is still present, inspect the charging system for proper operation.
5. Install a filter GM P/N 1224205 in the battery voltage feed circuit to the radio.
6. If the noise is not eliminated, install the filter in each following variation:
 - Install the filter with the single wire side toward the radio and the ground wire attached to chassis ground.
 - Remove the ground to the filter.
 - Reverse the filter so the 2-wire side is toward the radio with the ground wire attached to chassis ground.

- Remove the ground from the filter.

7. If the filter GM P/N 1224205 causes a delay when turning the radio ON or OFF or other problems, remove the filter and install a 0.47 micro farad capacitor to chassis ground.
8. Before reassembling the vehicle, remove any unneeded filters.
9. Test the functionality all of the vehicle systems for proper operation and function.

RADIO POOR RECEPTION

Schematic Reference: [Radio/Audio System Schematics](#)

Diagnostic System Check - Vehicle

Always perform the Diagnostic System Check - Vehicle, before proceeding with these diagnostic procedures. Refer to [Diagnostic System Check - Vehicle](#).

Diversity Antenna System

This diversity antenna system is comprised of 3 antenna grid patterns interfacing with the rear defog grid, a radio antenna module, a coax and a 14-volt power feed from the radio to the antenna module.

In AM and WX mode, the system functions as follows:

The antenna module takes the signal from only the AM/FM1 antenna pattern on the rear window. The antenna module amplifies this signal and sends it to the radio. In this mode the radio does not supply any voltage to the center conductor of the coax and there is no feedback signal present on the coax.

In FM mode the system functions as follows:

The antenna module takes the best signal from 1 of the 3 FM antenna patterns on the rear window. The antenna module amplifies this signal and sends it to the radio. In this mode, the radio supplies 12 volts to the center conductor of the coax and this switches the module into FM mode. The radio also supplies a feedback signal, along the coax, to the AM/FM antenna module, which indicates the quality of the signal. Based on the measured input signal level and the feedback from the radio, the antenna module switches between the 3 antennas to find the best signal.

The following information lists the most probable cause of the concern to the least probable cause, followed by the appropriate test for that condition. If the test leads to the replacement of a component, always inspect for a poor connection before proceeding with the replacement. Refer to [Testing for Intermittent Conditions and Poor Connections](#) and [Connector Repairs](#).

Perform the Antenna System Test and test the antenna coax cable prior to performing any of the following tests.

Poor Reception on Both AM and FM Bands

- The radio antenna module is not grounded properly. The module grounding screws should be clean and tight. The antenna module ground is either a chassis ground or a ground strap. Measure the resistance from the antenna module base plate to a good ground. Resistance should be 0.20 ohms or less. Find and correct the condition if the resistance is out of specification.
- The antenna 14-volt switch supply voltage circuit to the radio antenna module is open or shorted to ground. Test the antenna 14-volt switch supply voltage circuit for an open or short to ground. Refer to [**Circuit Testing and Wiring Repairs**](#).
- Defective antenna module-Replace the antenna module. Refer to [**Radio Antenna Module Replacement**](#) for service procedure.
- Defective antenna grid-Refer to [**Rear Window Replacement**](#).

Poor Reception on AM Band Only

- The antenna 14-volt switch supply voltage circuit to the radio antenna module is open or shorted to ground. Test the antenna 14-volt switch supply voltage circuit for an open or short to ground. Refer to [**Circuit Testing and Wiring Repairs**](#).
- Defective antenna module-Replace the antenna module. Refer to [**Radio Antenna Module Replacement**](#) for service procedure.
- Defective antenna grid-Refer to [**Rear Window Replacement**](#).

Poor Reception on FM Band Only

- The Antenna 14-volt switch supply voltage circuit to the radio antenna module is open or shorted to ground. Test the antenna 14-volt switch supply voltage circuit for an open or short to ground. Refer to [**Circuit Testing and Wiring Repairs**](#).
- Defective antenna module-Replace the antenna module. Refer to [**Radio Antenna Module Replacement**](#) for service procedure.
- Defective antenna grid-Refer to [**Rear Window Replacement**](#).

DIGITAL RADIO POOR OR NO RECEPTION**Diagnostic Fault Information**

Perform the [**Diagnostic System Check - Vehicle**](#) prior to using this diagnostic procedure.

Circuit/System Description

The antenna signal circuit is a coaxial cable that carries the radio signal information received

by the antenna. The antenna cable also provides a path for DC current for powering the antenna.

Reference Information**Schematic Reference****Radio/Audio System Schematics****Connector End View Reference****Entertainment Connector End Views****Description and Operation****Radio/Audio System Description and Operation****Electrical Information Reference**

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Special Tools Required

EL-48028 Digital Radio Test Antenna. See **Special Tools**.

Circuit/System Verification

Make sure the vehicle is outside in an area with an unobstructed view of the southern sky. Turn ON XM radio. Tune the radio to satellite channel 1. If the reception is not clear, contact XM at 1-800-852-9696 to verify customer account status or possible network problems.

Circuit/System Testing

1. Ignition OFF, disconnect the antenna coax from the digital radio receiver (DRR). Connect the test antenna to the DRR.
2. Turn the ignition ON, radio ON tuned to XM. Is the reception improved?
 - If the reception is not improved, replace the DRR.
3. Ignition OFF. Disconnect the DRR antenna from the coaxial cable. Test the resistance of the antenna coaxial cable center conductor from end to end. Verify the resistance is less than 5 ohms.
 - If the resistance is greater than 5 ohms, replace the antenna coaxial cable.
4. Test the resistance of the antenna coaxial cable outer shield from end to end. Verify the

resistance is less than 5 ohms.

- If the resistance is greater than 5 ohms, replace the antenna coaxial cable.

5. Test the resistance of the antenna coaxial cable between the center conductor and the outer conductor. Verify there is infinite resistance between both conductors.

- If there is less than infinite resistance between the inner conductor and the outer conductor of the coaxial cable, replace the antenna coaxial cable. If the coaxial cable tests normal, replace the digital radio antenna.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Digital Radio Antenna Cable Replacement**
- **Cellular Communications/Digital Radio Antenna Replacement**
- **Control Module References** for DRR replacement, setup and programming

AUDIO DISTORTION - ONE OR MORE SPEAKERS

Schematic Reference: **Radio/Audio System Schematics**

Connector End View Reference: **Entertainment Connector End Views**

Diagnostic System Check - Vehicle

Always perform the Diagnostic System Check - Vehicle before proceeding with these diagnostic procedures. Refer to **Diagnostic System Check - Vehicle**.

Left Channel - Audio Distortion

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause followed by the appropriate test for that condition. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with the replacement. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs .

Left Front Low Level Audio Signal circuit open - Test the left front low level audio signal circuits for an open. Refer to **Circuit Testing** and **Wiring Repairs**.

Right Channel - Audio Distortion

Right Front Low Level Audio Signal circuit open - Test the right front low level audio signal circuits for an open. Refer to **Circuit Testing** and **Wiring Repairs**.

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One Speaker - Audio Distortion

1. Speaker output from Amplifier open or shorted to voltage - Test the appropriate speaker output for an open or short to voltage. Refer to [Circuit Testing](#) and [Wiring Repairs](#).
2. Defective speaker - Replace the appropriate speaker. Refer to [Speaker Replacement Reference](#).
3. Defective Amplifier - Replace the Amplifier. Refer to [Control Module References](#) for Replacement, Setup or Programming.

Audio Distortion from Rear Speaker During 5.1 DSS DVD Playback

Audio output from radio open - Test the appropriate output from the radio for an open. Refer to [Circuit Testing](#) and [Wiring Repairs](#).

RADIO DISPLAYS LOC, LOCKED OR CODE

Radio Displays LOC, LOCKED or CODE

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	<u>Go to Diagnostic System Check - Vehicle</u>
2	<ol style="list-style-type: none">1. Install a scan tool.2. Turn ON the ignition, with the engine OFF.3. With a scan tool, perform the VIN Relearn procedure. On the scan tool, go to Module Replacement/Setup in Vehicle Control Systems and select Radio. <p>Does the scan tool indicate that the VIN Relearn procedure is complete and successful?</p>		
3	<p>Inspect for poor connections at the harness connector of the radio. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u>.</p> <p>Did you find and correct the condition?</p>	Go to Step 2	Go to Step 4

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4	<ol style="list-style-type: none"> 1. Replace the radio. Refer to <u>Radio Replacement</u>. 2. Perform the VIN Relearn procedure with a scan tool. On the scan tool, go to Module Replacement/Setup in Vehicle Control Systems and select Radio. <p>Did you complete the replacement?</p>	-	-
5	<p>Operate the system in order to verify the repair.</p> <p>Did you correct the condition?</p>	System OK	Go to Step 2

NOISE COMPENSATED VOLUME INOPERATIVE

Noise Compensated Volume Inoperative

Step	Action	Value	Yes	No
Schematic Reference: <u>Radio/Audio System Schematics</u>				
Connector Reference: <u>Entertainment Connector End Views</u>				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	<u>Diagnostic System Check - Vehicle</u>
2	<ol style="list-style-type: none"> 1. Turn ON the ignition, with the engine ON. 2. Turn ON the blower motor on the maximum speed. 3. Cycle the auto volume control ON and then OFF. <p>Is a difference in volume heard?</p>	-	<u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	<ol style="list-style-type: none"> 1. Turn ON the ignition, with the engine OFF. 2. Disconnect the noise compensation microphone. 3. Measure the voltage from the noise compensation microphone supply voltage 	8 V	-	-

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	circuit to the drain wire.			
	Does the voltage measure near the specified value?		Go to Step 4	Go to Step 5
4	Replace the Onstar microphone. Refer to <u>Mobile Telephone Microphone Replacement</u> . Did you complete the replacement?	-	Go to Step 9	-
5	Test the noise compensation microphone supply voltage circuit for an open or short. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	-	Go to Step 9	Go to Step 6
6	Test the drain wire circuit for an open or short. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	-	Go to Step 9	Go to Step 7
7	Inspect for poor connections at the amplifier. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> . Did you find and correct the condition?	-	Go to Step 9	Go to Step 8
8	Replace the amplifier. Refer to <u>Control Module References</u> . Did you complete the repair?	-	Go to Step 9	-
9	Operate the system in order to verify the repair. Did you correct the condition?	-	System OK	Go to Step 3

REDUCED VOLUME - ONE OR MORE SPEAKERS

Schematic Reference: **Radio/Audio System Schematics**

Connector End Views Reference: **Entertainment Connector End Views**

Always perform the Vehicle Diagnostic System Check before proceeding with these diagnostic procedures. Refer to **Diagnostic System Check - Vehicle**.

Speakers - Reduced Volume

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with replacement. Refer to **Testing for Intermittent Conditions and Poor Connections and Connector Repairs**.

1. Speaker output circuit high resistance-Test the appropriate speaker output circuits from the audio amplifier for high resistance. Refer to **Circuit Testing** and **Wiring Repairs**.
2. Low level audio circuit open-Test the appropriate low level audio circuit between the radio and audio amplifier for an open. Refer to **Circuit Testing** and **Wiring Repairs**.
3. Defective speaker-Replace the appropriate speaker. Refer to **Speaker Replacement Reference**.

SPEAKERS INOPERATIVE - ONE OR MORE

Schematic Reference: **Radio/Audio System Schematics**

Connector End Views Reference: **Entertainment Connector End Views**

Diagnostic System Check - Vehicle

Always perform the Vehicle Diagnostic System Check before proceeding with these diagnostic procedures. Refer to **Diagnostic System Check - Vehicle**.

All Speakers on One Channel Inoperative

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause followed by the appropriate test for that condition. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with the replacement. Refer to **Testing for Intermittent Conditions and Poor Connections and Connector Repairs**.

1. Low level audio signal circuit open or shorted-Test all low level audio signal circuits between the radio and audio amplifier for an open or short. Refer to **Circuit Testing** and **Wiring Repairs**.

2. Right channel inoperative with Bose-Test the right rear door speaker output circuits for a short. Refer to **Circuit Testing** and **Wiring Repairs**.
3. No audio output from the amplifier-Replace the amplifier. Refer to **Control Module References**.

All Speakers on One Channel Inoperative Only on Digital Radio

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause followed by the appropriate test for that condition. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with the replacement. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs.

1. Right or left audio signal circuit open or shorted-Test the appropriate audio signal circuits between the DRR and the radio for an open or short. Refer to **Circuit Testing** and **Wiring Repairs**.
2. No audio output from the digital radio receiver-Replace the digital radio receiver. Refer to **Control Module References**.

One Speaker Inoperative

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with replacement. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs.

1. Speaker output open or shorted-Test the appropriate speaker output circuits from the audio amplifier for an open or short. Refer to **Circuit Testing** and **Wiring Repairs**.
2. No audio output from the amplifier-Test for any AC voltage between the appropriate speaker output circuits at the speaker harness connector, disconnected with the radio volume adjusted to an audible level. If AC voltage is present, replace the speaker. Refer to **Speaker Replacement Reference**. If no AC voltage is present, replace the amplifier. Refer to **Control Module References**.
3. Defective speaker-Replace the inoperative speaker. Refer to **Speaker Replacement Reference**.

SPEAKERS INOPERATIVE - ALL

Schematic Reference: Radio/Audio System Schematics

Connector End View Reference: Entertainment Connector End Views

Diagnostic System Check - Vehicle

Always perform the Diagnostic System Check - Vehicle before proceeding with these diagnostic procedures. Refer to **Diagnostic System Check - Vehicle**.

All Speakers Inoperative Only on Digital Radio

IMPORTANT: The following information lists the most probable cause of the concern to the least probable cause followed by the appropriate test for that condition. If the list leads to the replacement of a component, always inspect for a poor connection before proceeding with the replacement. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs.

1. Right or left audio signal circuit shorted to battery positive voltage-Test all audio signal circuits for a short to battery positive voltage. Refer to **Circuit Testing** and **Wiring Repairs**.
2. No audio output from the digital radio receiver-Replace the digital radio receiver. Refer to **Control Module References**.

RADIO SETUP

Without U3U

1. To setup a new radio for the vehicle, complete the Module Setup procedure under the Special Functions menu of the scan tool.
2. Cycle ignition with the retained accessory power (RAP) disabled, when complete

With U3U (Navigation Radio)

1. Radio setup completed using the Service Programming System (SPS). Refer to **Service Programming System (SPS)**.
2. Cycle ignition, with the retained accessory power (RAP) disabled, when complete.

DIGITAL RADIO RECEIVER SETUP

XM(tm) Activation

IMPORTANT: After replacement of an XM(tm) receiver, call XM(tm) radio to

**deactivate the receiver that has been removed from the vehicle.
The vehicle must be parked in view of a satellite within 24
hours after an activation call.**

1. Turn the radio ON, tune to the XM(tm) channel 0 and record the radio ID. The radio ID will be needed for activation of the new receiver.
2. Call XM(tm) radio to deactivate the faulty receiver and activate the new receiver.
 - US: 1-800-556-3600
 - Canada: 1-877-438-9677
3. Park the vehicle outside in an area with an unobstructed view of the southern sky.
4. Leave the vehicle outside with the ignition switch in the ACC position and the radio on for 30 minutes to activate XM(tm) service.
5. Once activated, the radio will receive the remaining XM(tm) channels.

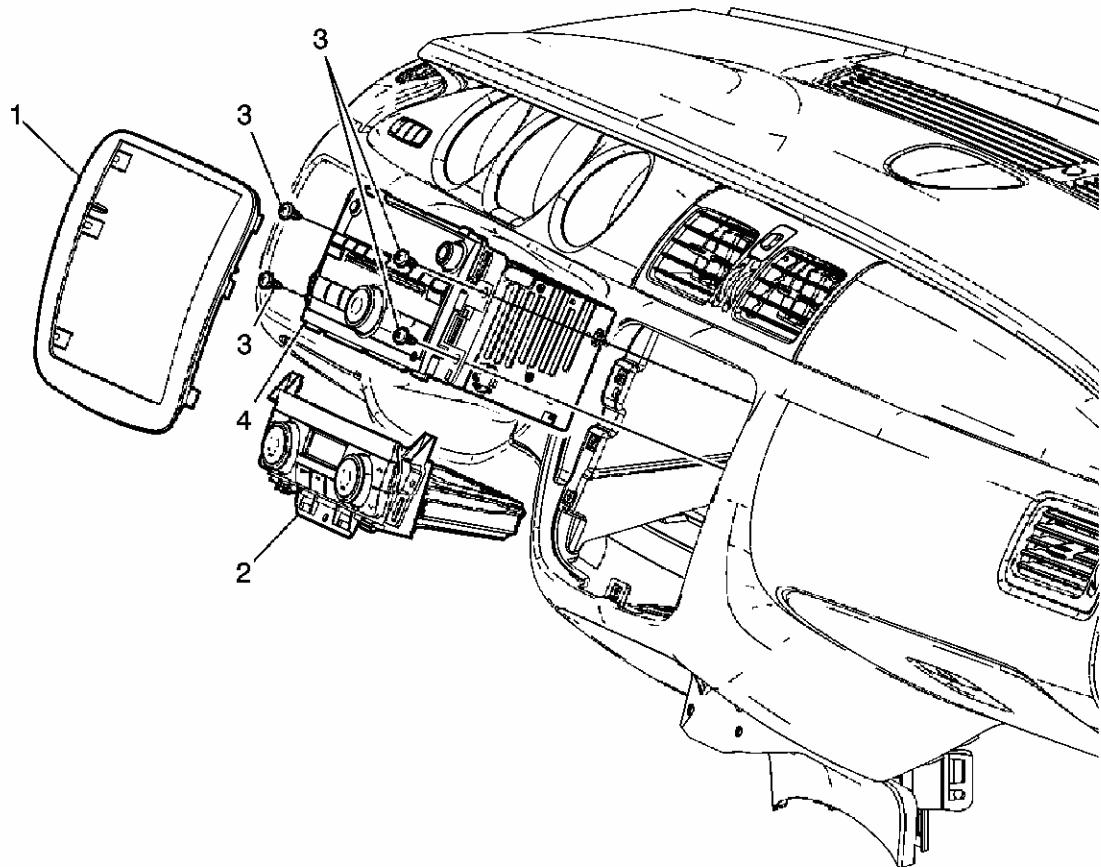
SPEAKER REPLACEMENT REFERENCE

Speaker Replacement Reference

Component	Repair Instruction
Front I/P Speaker	Refer to <u>Radio Front Speaker Replacement</u> .
Front Speaker (Tweeter)	Refer to <u>Front Upper Speaker Replacement</u>
Front Door Speaker	Refer to <u>Radio Front Side Door Lower Speaker Replacement</u>
Rear Speaker (Rear Shelf)	Refer to <u>Radio Rear Speaker Replacement</u>

REPAIR INSTRUCTIONS

RADIO REPLACEMENT

**Fig. 37: Identifying Radio**

Courtesy of GENERAL MOTORS CORP.

Radio Replacement

Callout	Component Name
1	Instrument Panel Center Trim Plate Refer to Instrument Panel Center Trim Panel Replacement .
2	Heating and Air Conditioning Control Assembly Refer to HVAC Control Module Replacement .
3	Radio Screws (Qty: 4) NOTE: Refer to Fastener Notice . Tighten: 2 N.m (18 lb in)
4	Radio Assembly Tip: <ul style="list-style-type: none"> • Disconnect the electrical connector. • Reprogram the radio after replacement. Refer to Control Module

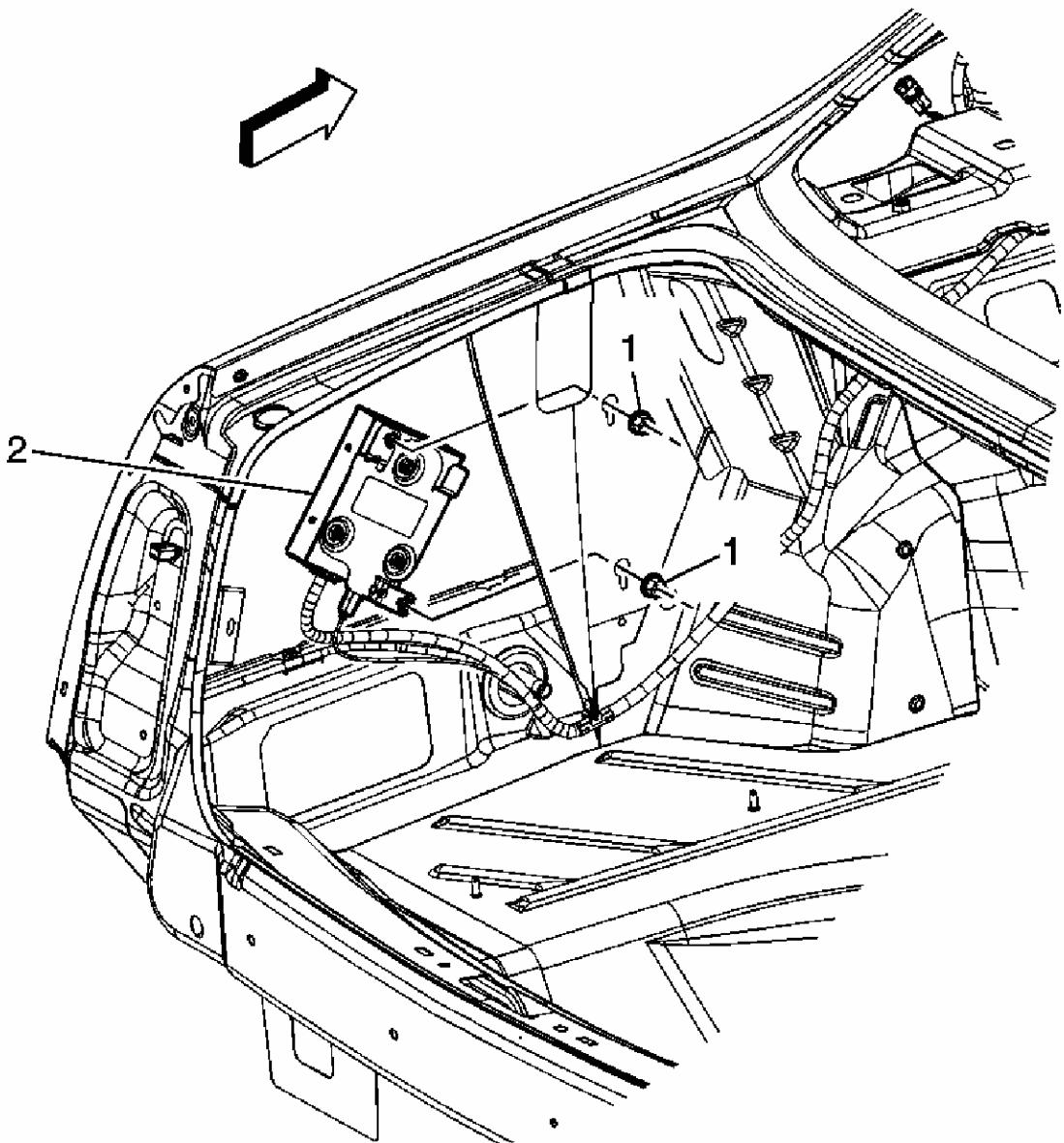
References**DIGITAL RADIO RECEIVER REPLACEMENT**

Fig. 38: Identifying Digital Radio Receiver
Courtesy of GENERAL MOTORS CORP.

Digital Radio Receiver Replacement

Callout	Component Name
Preliminary Procedure:	Remove the left rear quarter trim panel. Refer to Rear Compartment Trim Panel Replacement .

Digital Radio Receiver Nuts (Qty: 2)

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NOTE:

Refer to **Fastener Notice**.

1

Tighten: 10 N.m (89 lb in)

Tip: The nuts only need to be loosened enough so that the receiver can be moved so that the nuts will fit through the keyhole slot to remove.

2

Digital Radio Receiver Assembly

Tip:

1. Disconnect the antenna cable.
2. Reprogram the digital radio receiver after installation. Refer to **Control Module References**.

AMPLIFIER REPLACEMENT

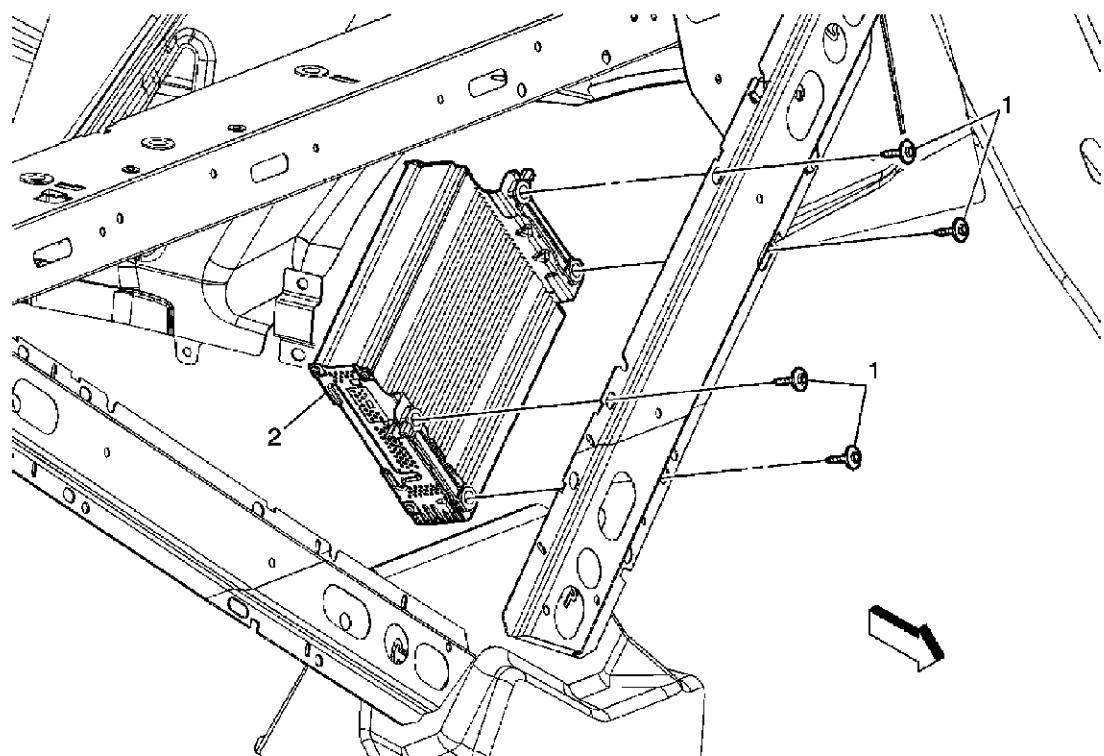


Fig. 39: Identifying Amplifier

Courtesy of GENERAL MOTORS CORP.

Amplifier Replacement

Callout	Component Name
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NOTE:

Refer to Fastener Notice .

Fastener Tightening Specifications: Refer to Fastener Tightening

Specifications.Preliminary Procedure: Remove the rear seat back. Refer to Rear Seat Back Replacement .

1	Radio Speaker Amplifier Assembly Bolts (Qty: 4) Tighten: 3 N.m (25 lb in)
2	Radio Speaker Amplifier Assembly Refer to <u>Control Module References</u> for programming and setup information.

COMPACT DISC CARE AND CLEANING**Care of CDs**

Handle CDs carefully. Store them in their original cases or other protective cases and away from direct sunlight and dust. The CD player scans the bottom surface of the disc. If the surface of a CD is damaged, such as cracked, broken, scratched or wrinkled labeling, the CD will not play properly or not at all. If the surface of a CD is soiled, take a soft, lint free cloth or dampen a clean, soft cloth in a mild, neutral detergent solution mixed with water and clean it. Make sure the wiping process starts from the center to the edge. Do not touch the bottom side of a CD while handling it. This could damage the surface. Pick up CDs by grasping the outer edges or the edge of the hole and the outer edge.

Care of the CD Player

The use of CD lens cleaners for CD players is not advised, due to the risk of contaminating the internal lens of the CD optics with lubricants.

Stuck CDs

Interrupting the battery power by pulling the fuse will sometimes release a stuck CD. If a CD is stuck and removed, inspect it for warps, cracks, etc. If the CD is damaged, do not replace the radio.

Labeling CDs

Paper labels can eventually warp and wrinkle and this will cause the disc to jam inside the CD player. Try labeling the top of the discs with a soft magic marker instead.

CASSETTE PLAYER CARE AND CLEANING**Tools Required**

J 39916-A Audio System Diagnostic Kit. See **Special Tools**.

If you do not regularly clean the tape player, the tape player is subject to the following conditions:

- Reduced sound quality
- Ruined cassettes
- A damaged tape mechanism

Cassette tapes may not operate properly if they are not stored in their cases away from the following conditions:

- Contaminants
- Direct sunlight
- Extreme heat

Cleaning Intervals

Clean the cassette tape player every 15 hours of operation for optimum performance.

Clean the cassette tape player at a maximum of every 50 hours of playing time. This will prevent damage to the cassette tape player mechanism. The radio may display CLN, CLEAN or CLEAN TAPE (depending on the family of radio being used), if equipped with the Clean Tape Indicator Feature. This indicates that you have used the tape player for 50 hours without resetting the tape clean timer. If this message appears on the display, clean the cassette tape player. The player will still play tapes, however the player should be cleaned as soon as possible in order to prevent damage to the tapes and/or the player.

Cassettes are subject to wear and the sound quality may degrade over time. If you notice a reduction in sound quality, play a different cassette. A new cassette will indicate whether the tape or the tape player is at fault.

If the sound quality does not improve when the second tape is played, clean the cassette player. Perform this step regardless of when you last cleaned the cassette player.

If a noticeable improvement is not achieved after cleaning the player, remove the radio assembly for repair.

Head and Capstan Cleaning

The following two components are cleaned on a tape player:

- The head
- The capstan

IMPORTANT: Do not contact the tape head with magnetized tools. If the head becomes magnetized, every cassette played in the player will be degraded.

In order to properly clean a tape player, the preferred method is to use the cleaning cassette in **J 39916-A**. See Special Tools.

To prevent the cleaning cassette from being ejected, perform the following steps:

1. Turn the ignition switch to one of the following positions (depending on the vehicle line):
 - ON
 - RUN
 - ACC
 - ACCESSORY
2. Turn the radio off.
3. Press and hold the TAPE button for 5 seconds. The tape symbol on the display will flash for 2 seconds.
4. Insert the scrubbing action cleaning cassette.
5. Eject the cleaning cassette after the manufacturer's recommended cleaning time. When the cleaning cassette has been ejected, the Cut Tape Detection Feature is active again.

The alternative method is to use a non scrubbing action, wet type cleaning cassette. This cassette uses a fabric belt in order to clean the tape head. This type of cleaning cassette will not eject on its own. A non scrubbing action cassette may not clean as thoroughly as the scrubbing type cleaning cassette. The use of this cassette is not recommended.

After you clean the player, press and hold the EJECT button for 5 seconds in order to reset the CLEAN indicator. The radio will display --- in order to show that the indicator has been reset.

RADIO ANTENNA MODULE REPLACEMENT

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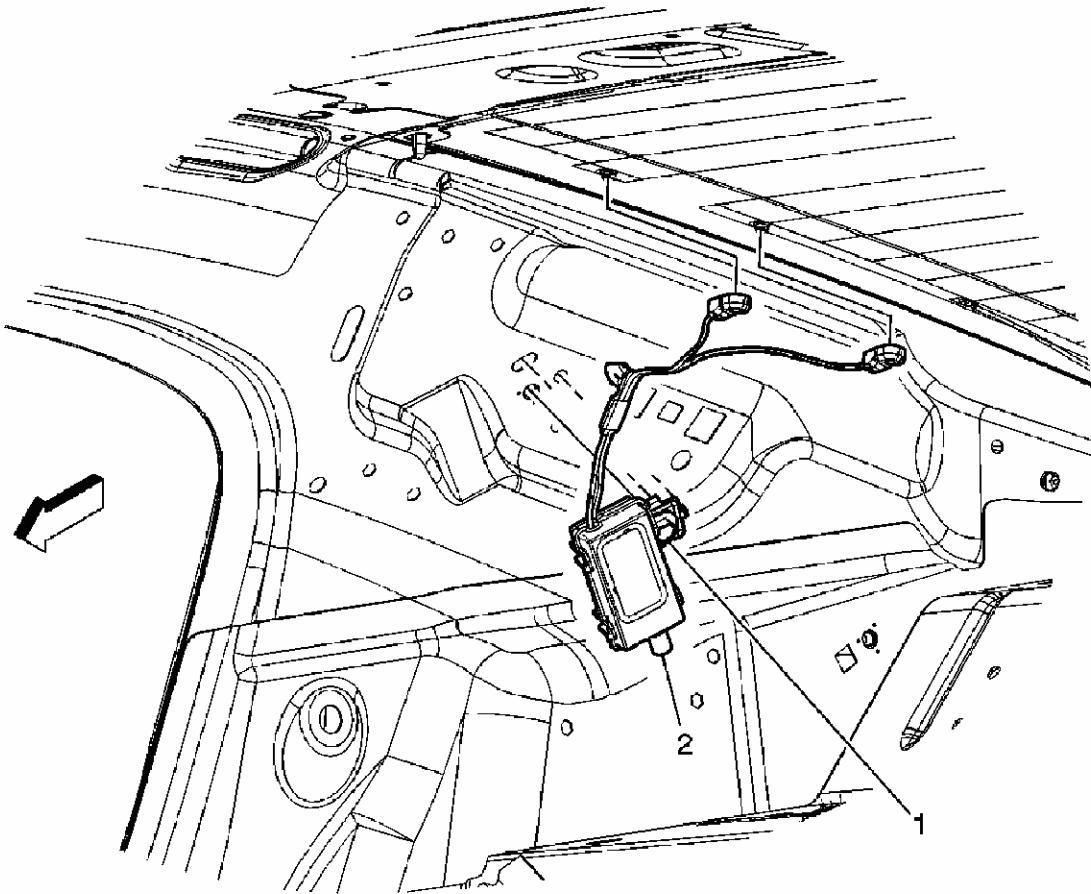


Fig. 40: View Of Radio Antenna Module

Courtesy of GENERAL MOTORS CORP.

Radio Antenna Module Replacement

Callout	Component Name
Fastener Tightening Specifications: Refer to Fastener Tightening Specifications .	
Preliminary Procedure: Remove the rear quarter upper trim panel. Refer to Rear Quarter Upper Trim Panel Replacement .	
1	Radio Antenna Module Screw
2	Radio Antenna Module Tip: <ul style="list-style-type: none">• Disconnect the antenna leads from the rear window.• Disconnect the antenna connector.

DIGITAL RADIO ANTENNA REPLACEMENT

Removal Procedure

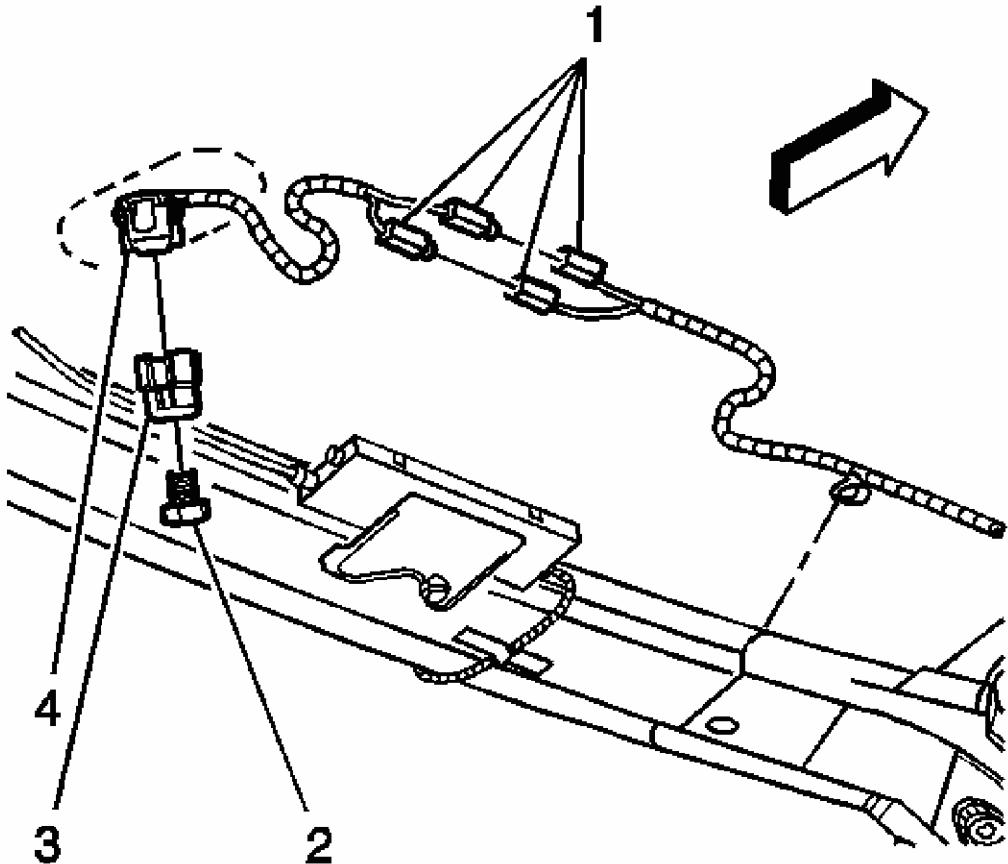


Fig. 41: View of Digital Radio Antenna Connectors, Bolt, Expansion Sleeve and Retainer

Courtesy of GENERAL MOTORS CORP.

NOTE: DO NOT apply paint or clear coat to the antenna. This will damage the function of the antenna, causing poor reception or loss of signal reception.

1. Remove the upper rear quarter trim panel. Refer to [Rear Quarter Upper Trim Panel Replacement](#).
2. Remove the rear assist handles. Refer to [Assist Handle Replacement](#).

NOTE: Use care when removing or installing the headliner. Excessive bending will damage the headliner.

3. Lower the rear of the headliner.

4. Remove the antenna cable connection from above the AM/FM antenna module.
5. Remove the foam tape from the antenna cable connection.
6. Disconnect the digital radio antenna connectors (1).
7. Remove the antenna bolt (2) and expansion sleeve (3).

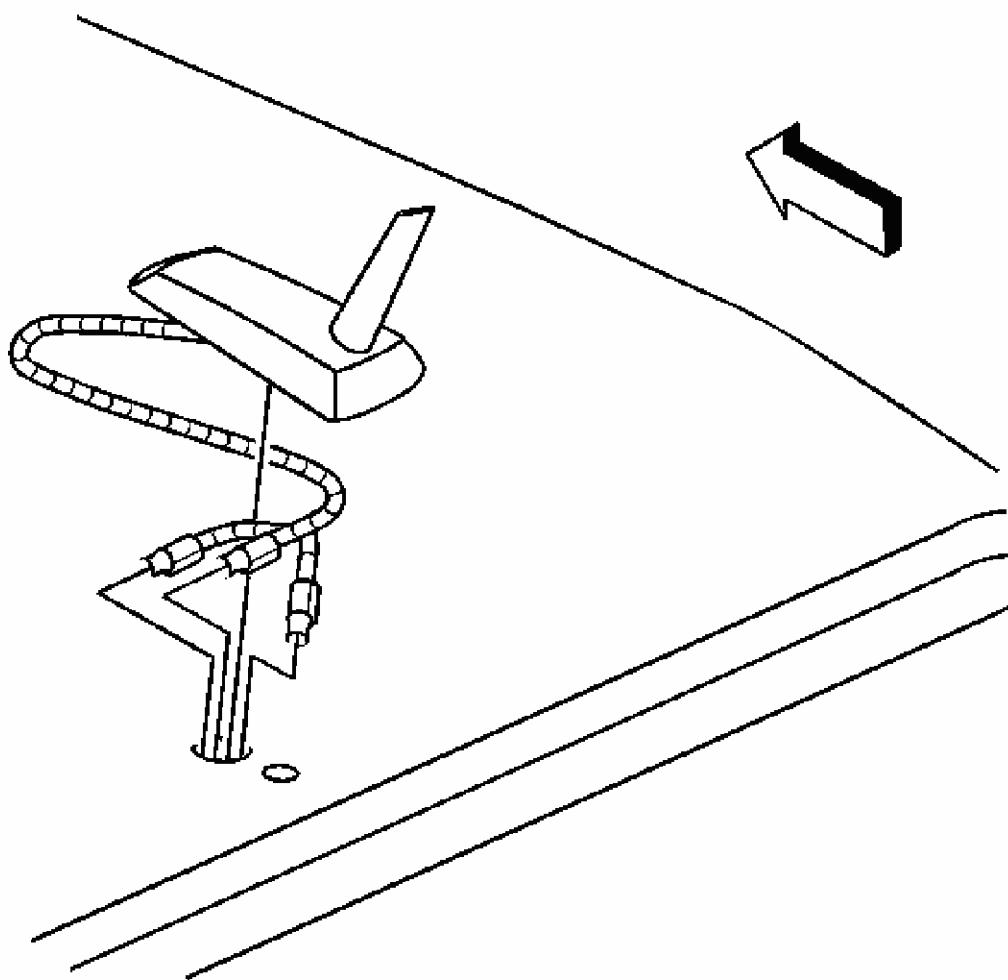


Fig. 42: View Of Antenna Assembly
Courtesy of GENERAL MOTORS CORP.

8. Remove the digital radio antenna.
9. Remove the screws securing the antenna mast to the antenna base.
10. Remove the mast.

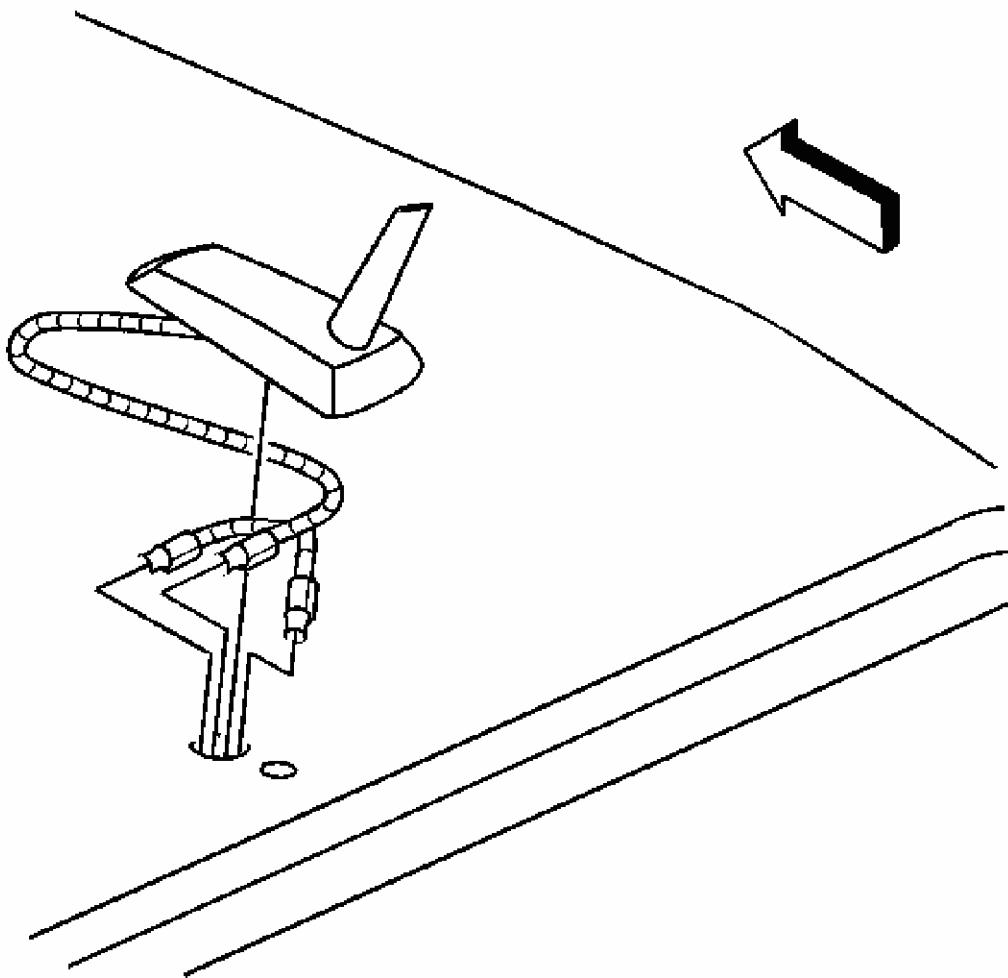


Fig. 43: View Of Antenna Assembly
Courtesy of GENERAL MOTORS CORP.

1. Install the antenna mast to the antenna base.

NOTE: Refer to Fastener Notice.

2. Install the antenna mast screws.

Tighten: Tighten the screws to 1 N.m (9 lb in).

3. Position the digital radio antenna to the roof.

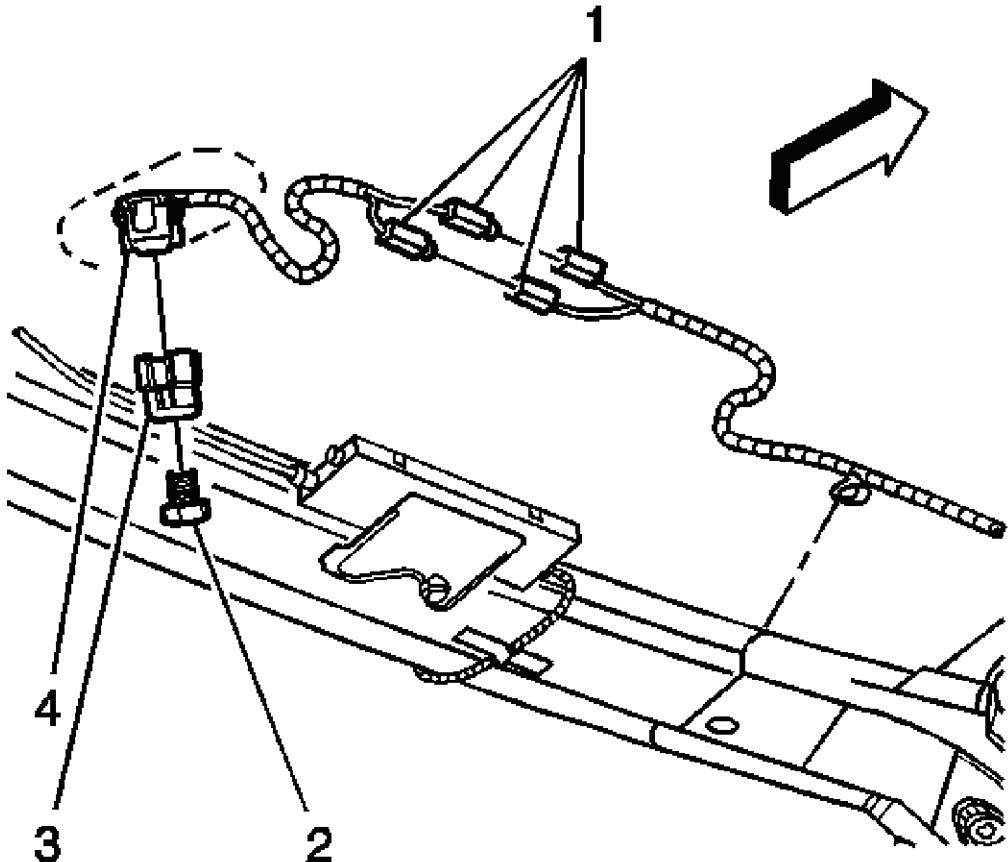


Fig. 44: View of Digital Radio Antenna Connectors, Bolt, Expansion Sleeve & Retainer

Courtesy of GENERAL MOTORS CORP.

4. Route the wiring pigtail to the side in the slot on the antenna shaft and install the antenna expansion sleeve (3) and bolt (2) to the antenna shaft.

Tighten: Tighten the bolt to 6 N.m (53 lb in).

5. Connect the antenna connectors (1).
6. Wrap the connectors (1) with foam tape.
7. Install the antenna cable connection above the AM/FM antenna module.
8. Install the antenna cable hold down clips.
9. Align the headliner to the roof panel.
10. Install the rear assist handles. Refer to Assist Handle Replacement.

11. Install the upper rear quarter trim panel. Refer to [Rear Quarter Upper Trim Panel Replacement](#).

DIGITAL RADIO ANTENNA CABLE REPLACEMENT

Removal Procedure

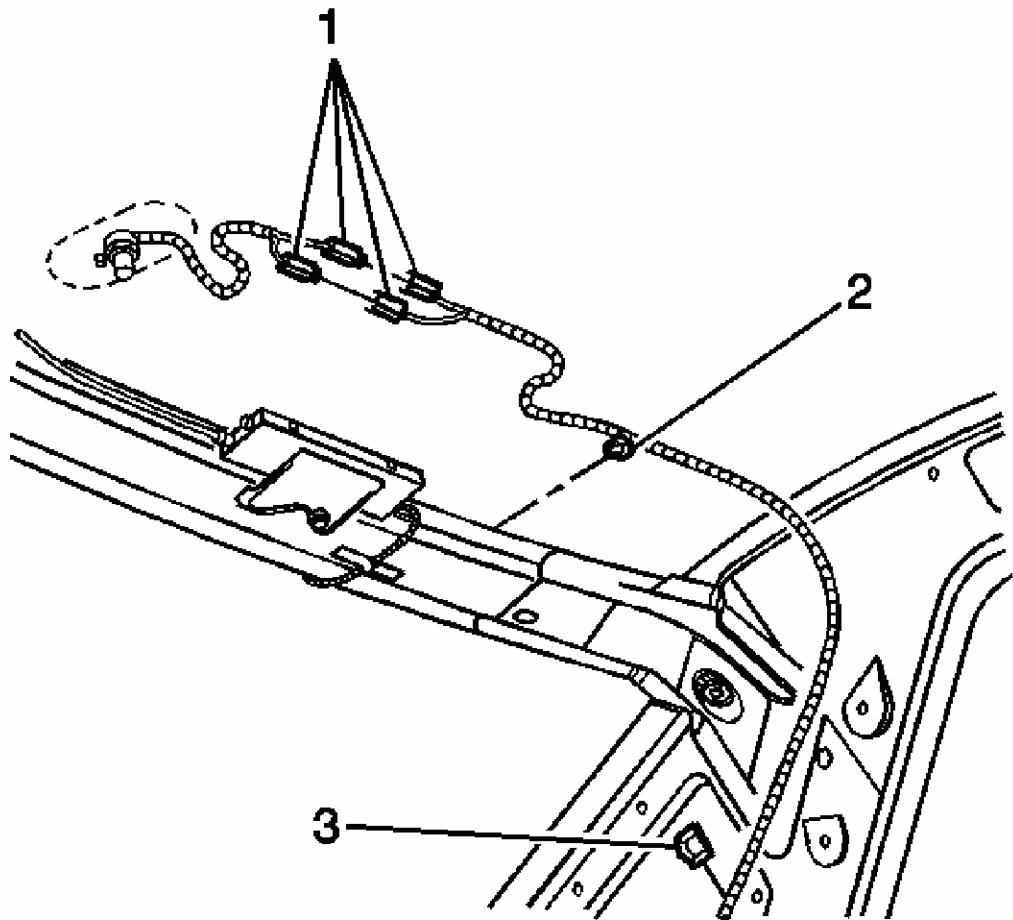


Fig. 45: View Of Antenna Cable

Courtesy of GENERAL MOTORS CORP.

1. Remove the upper rear quarter trim panel. Refer to [Rear Quarter Upper Trim Panel Replacement](#) in Interior Trim.
2. Remove the rear assist handles. Refer to [Assist Handle Replacement](#) in Interior Trim.

NOTE: Use care when removing or installing the headliner.

Excessive bending will damage the headliner.

3. Lower the rear of the headliner.
4. Remove the antenna cable from the clips (2,3)
5. Remove the antenna cable connection (1) from above the AM/FM antenna module.
6. Remove the foam tape from the antenna cable connection (1).
7. Disconnect the antenna connectors (1) from the radio antenna.
8. Attach a piece of wire or string to the end of the antenna cable.

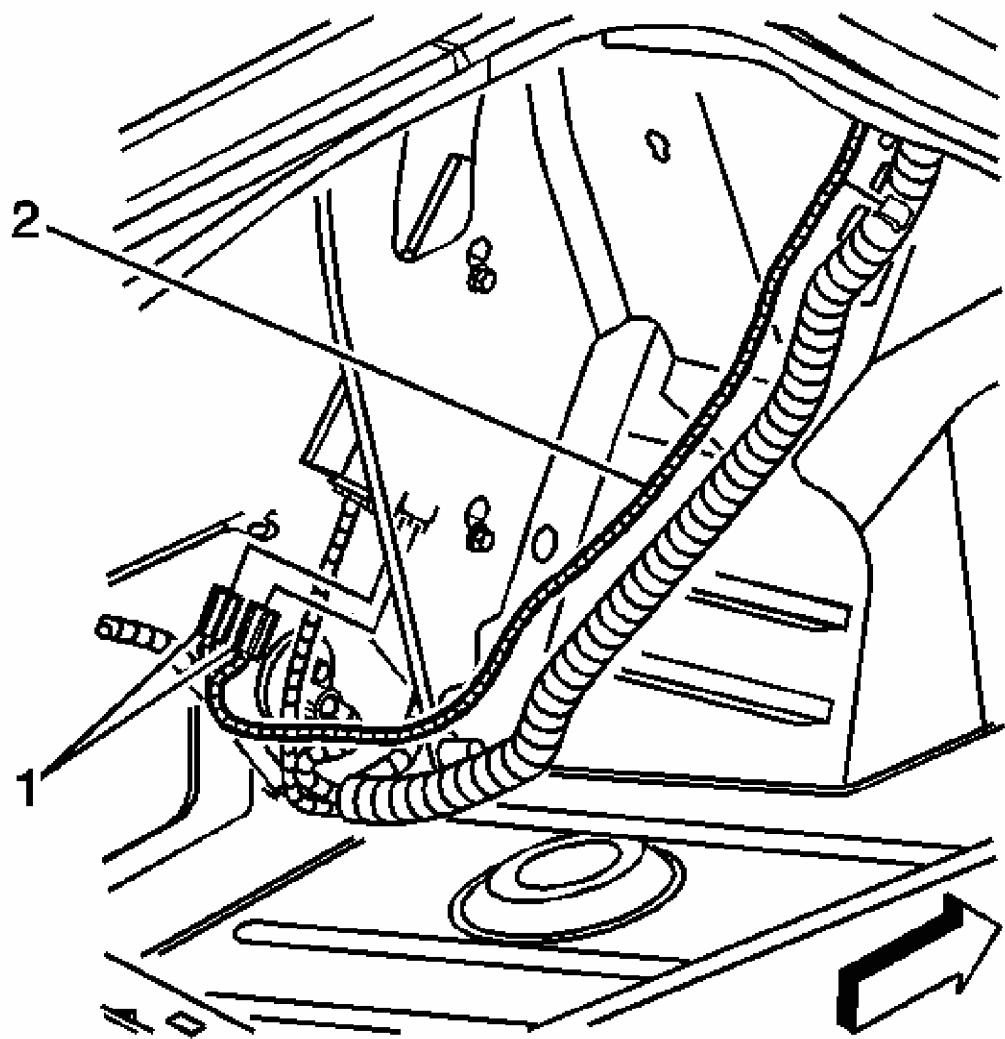
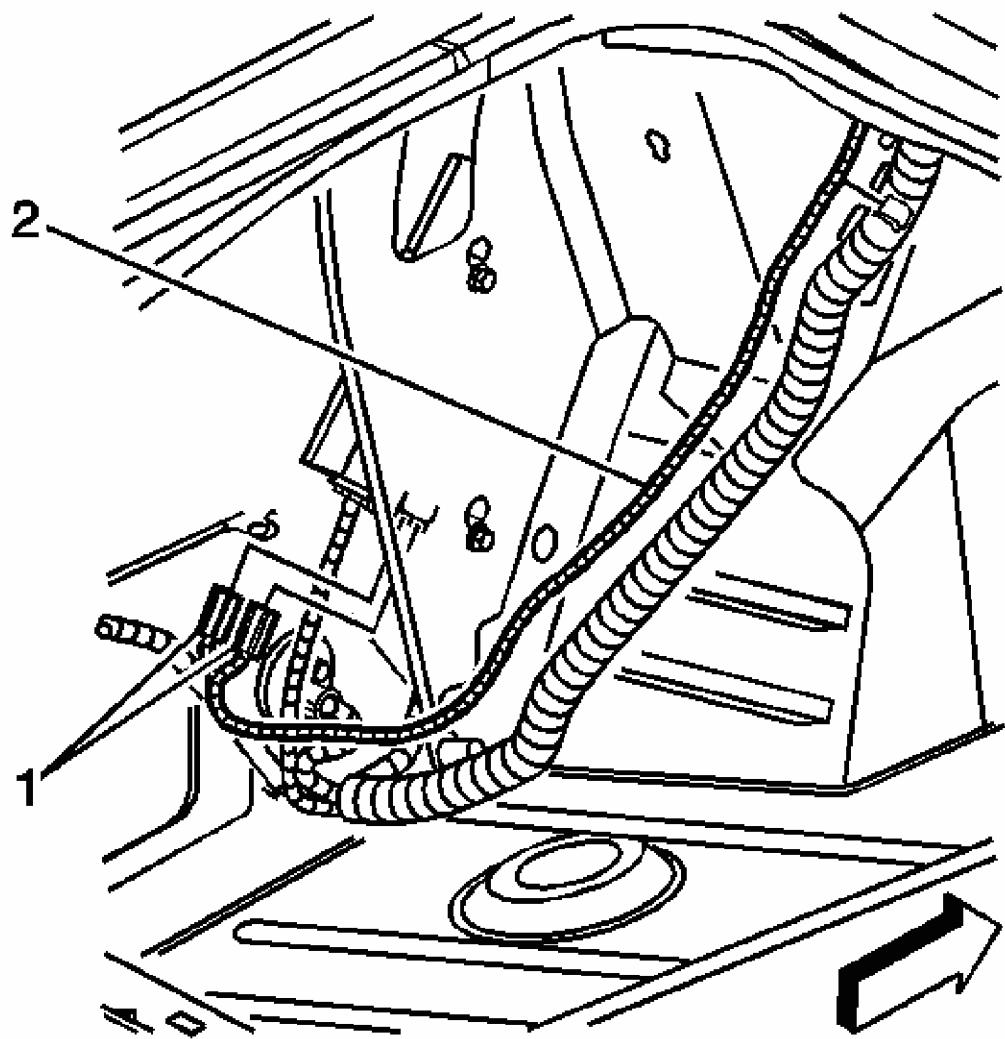


Fig. 46: Disconnecting/Attaching Antenna Cable To Module
Courtesy of GENERAL MOTORS CORP.

9. Remove the left rear compartment trim panel. Refer to **Rear Compartment Trim Panel Replacement** in Body Rear End.
10. Disconnect the antenna cable connection (1) from the digital receiver.
11. Remove the antenna cable (2) from the clips and the rear harness.
12. Pull the cable (2) through to the rear compartment.
13. Remove the wire or string from the antenna cable (2).
14. Remove the antenna cable (2) from the vehicle.

Installation Procedure**Fig. 47: Disconnecting/Attaching Antenna Cable To Module**

Courtesy of GENERAL MOTORS CORP.

1. Attach the wire or string used in the removal procedure to the cable being installed in the vehicle.
2. Carefully pull the antenna cable (2) past the rear shelf into the passenger compartment.
3. Remove the wire or string from the antenna cable.
4. Connect the antenna cable connection (1) to the digital receiver.
5. Attach the antenna cable (2) to the hold-down clips in the rear compartment.
6. Install the trim panel to the left rear compartment. Refer to **Rear Compartment Trim Panel Replacement** in Body Rear End.

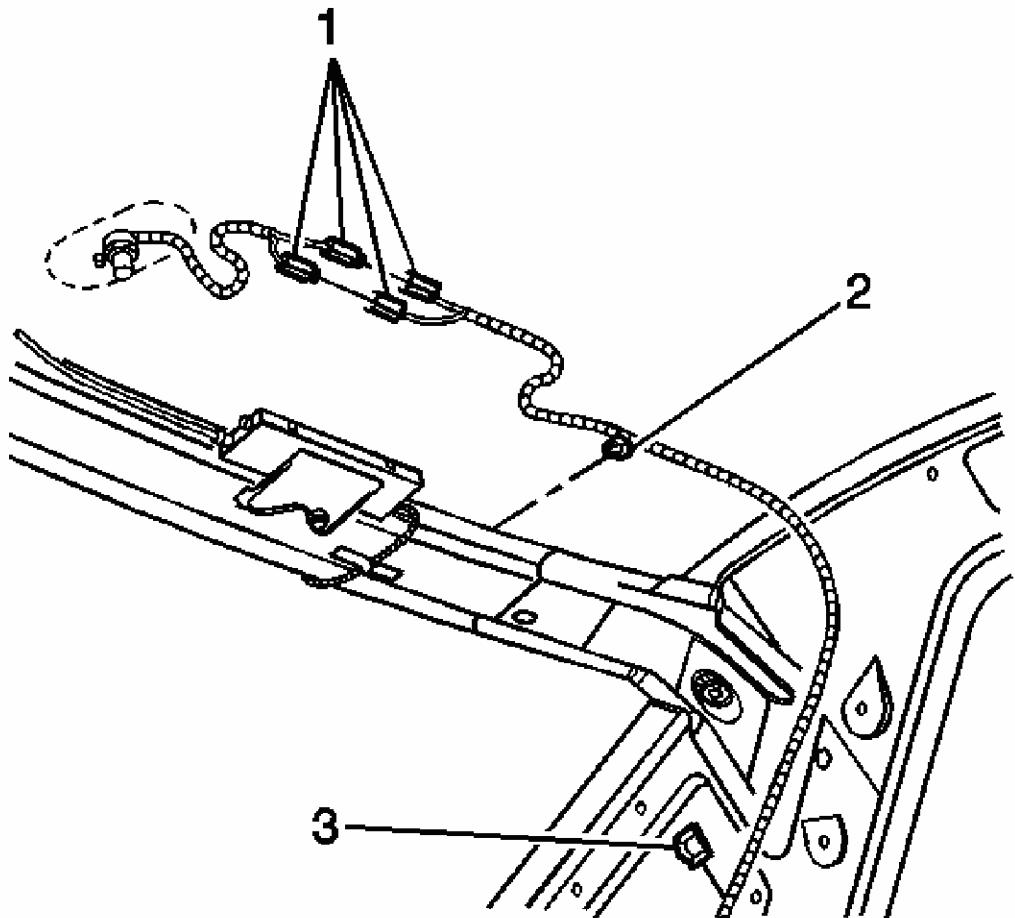


Fig. 48: View Of Antenna Cable

Courtesy of GENERAL MOTORS CORP.

7. Connect the antenna connectors (1) to the digital radio antenna.
8. Wrap the connector with foam tape (1).
9. Install the antenna cable connection (1) above the AM/FM antenna module.
10. Attach the antenna cable to the locating clips at the roof (2) and to the third pillar (3).
11. Align the headliner to the roof panel.
12. Install the rear assist handles. Refer to **Assist Handle Replacement** in Interior Trim.
13. Install the upper rear quarter trim panel. Refer to **Rear Quarter Upper Trim Panel Replacement** in Interior Trim

RADIO FRONT SPEAKER REPLACEMENT

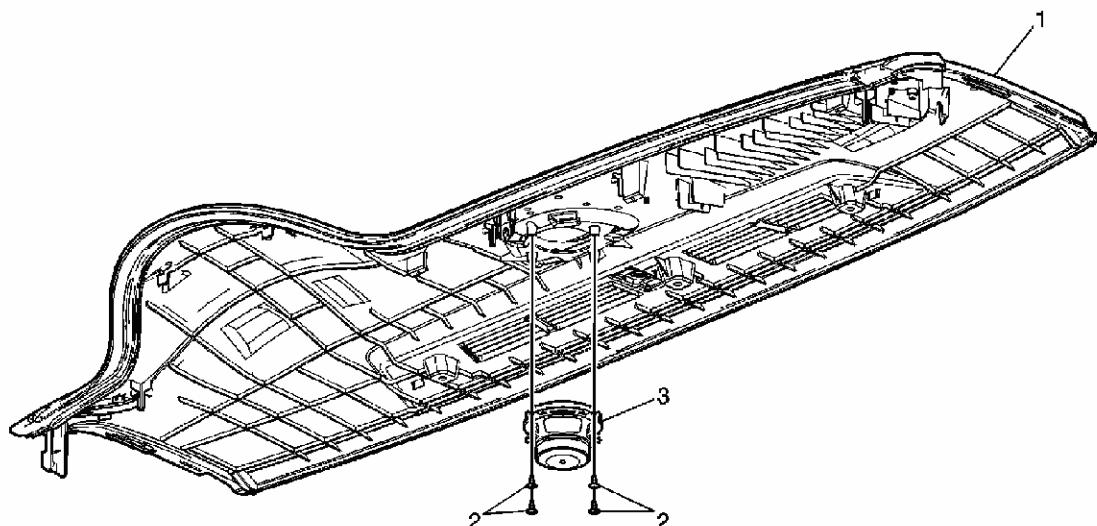


Fig. 49: Removing/Installing Radio Front Speaker

Courtesy of GENERAL MOTORS CORP.

Radio Front Speaker Replacement

Callout	Component Name
1	Instrument Panel Upper Trim Pad Refer to <u>Instrument Panel Upper Trim Pad Replacement</u> .
2	Radio Speaker Screw (Qty: 4) NOTE: Refer to <u>Fastener Notice</u> . Tighten: 2 N.m (18 lb in)
3	Radio Front Speaker Assembly Tip: Disconnect the electrical connector.

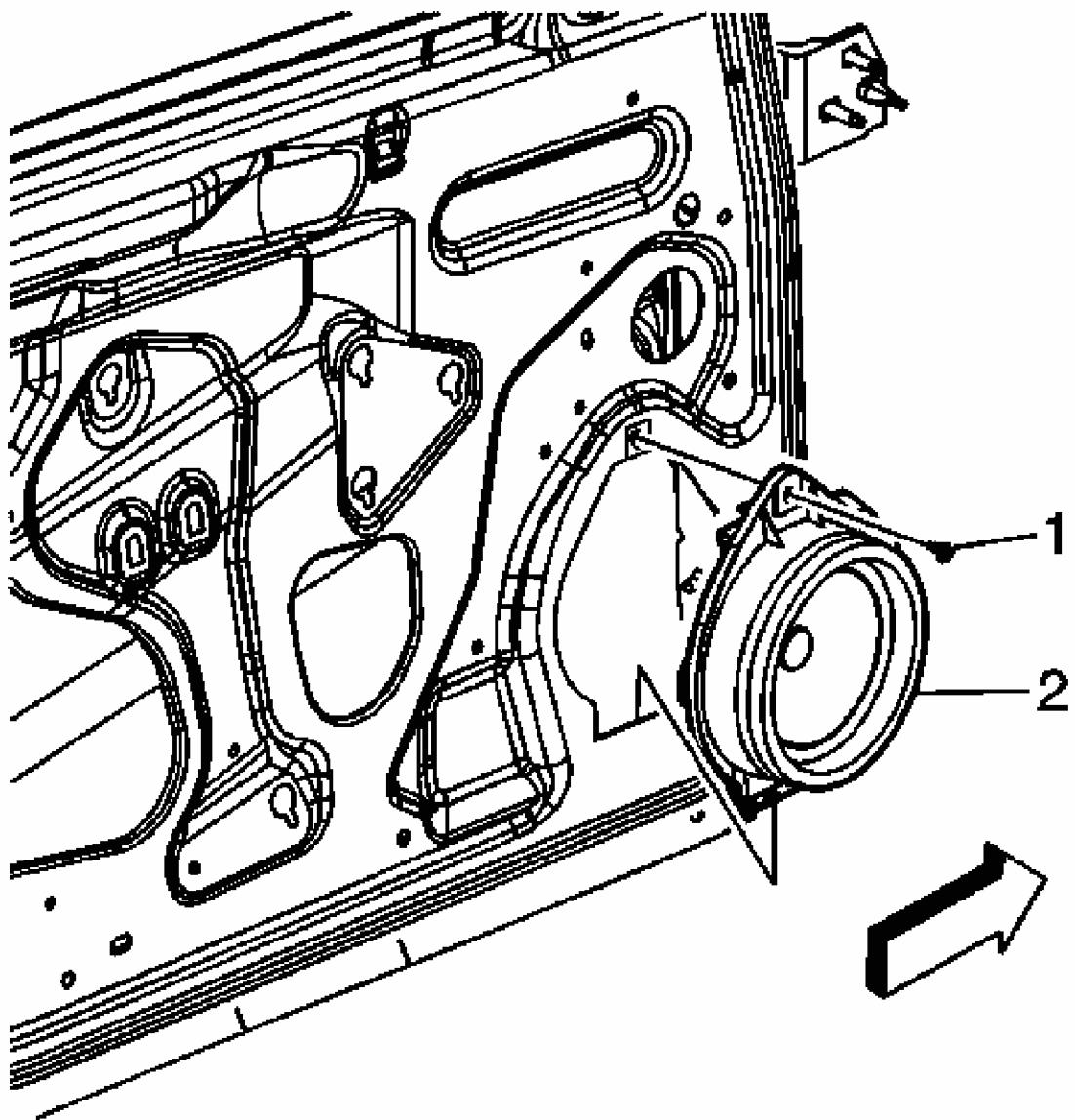
RADIO FRONT SIDE DOOR LOWER SPEAKER REPLACEMENT

Fig. 50: Removing/Installing Radio Front Side Door Lower Speaker
Courtesy of GENERAL MOTORS CORP.

Radio Front Side Door Lower Speaker Replacement

Callout	Component Name
<p>NOTE: Refer to <u>Fastener Notice</u>.</p> <p>Fastener Tightening Specifications: Refer to <u>Fastener Tightening Specifications</u>. Preliminary Procedure: Remove the front door trim panel. Refer to <u>Front Side Door Trim Panel Replacement</u>.</p>	

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1	Tighten: 2 N.m (18 lb in)
2	Speaker Assembly, Radio Front Side Door

FRONT UPPER SPEAKER REPLACEMENT

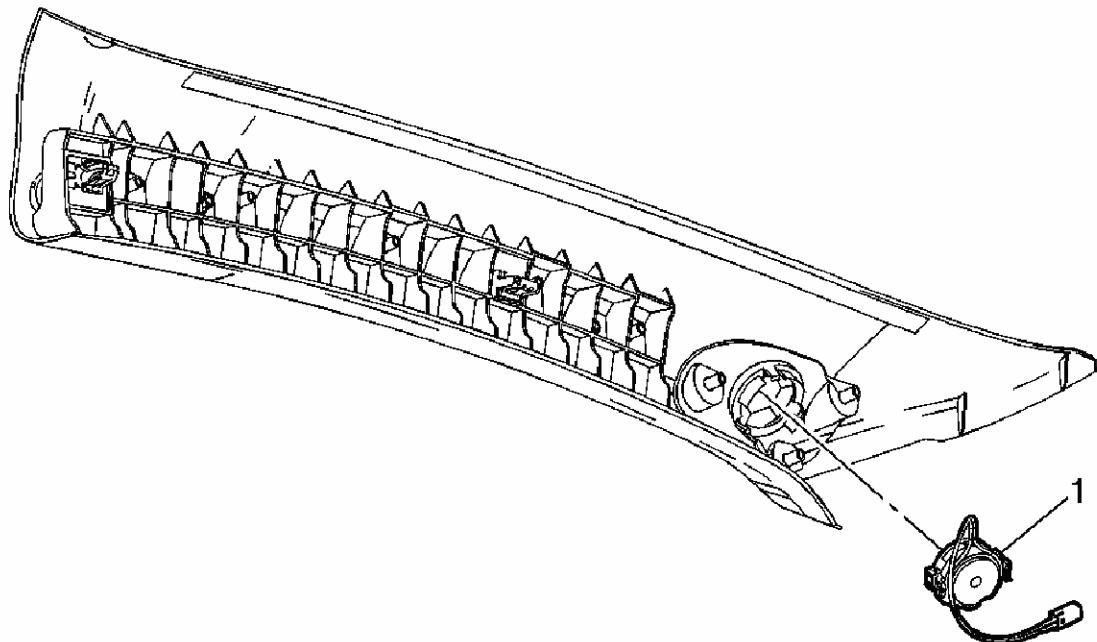


Fig. 51: Removing/Installing Front Upper Speaker

Courtesy of GENERAL MOTORS CORP.

Front Upper Speaker Replacement

Callout	Component Name
NOTE: <u>Refer to Fastener Notice .</u>	
1	Speaker Assembly, Radio Windshield Side Garnish Molding Tip: Release the tabs on the windshield pillar speaker carrier to remove the speaker from the molding.

RADIO REAR SPEAKER REPLACEMENT

Removal Procedure

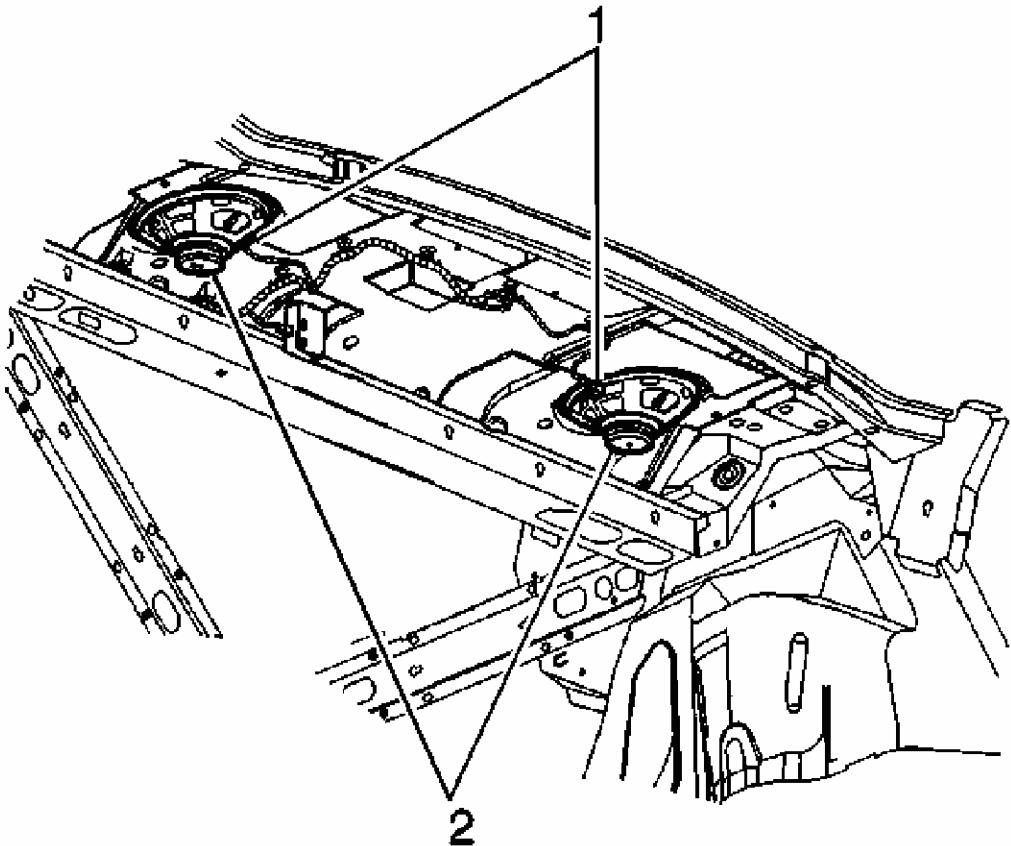


Fig. 52: Speaker Electrical Connectors View

Courtesy of GENERAL MOTORS CORP.

1. Lower the rear compartment trim. Refer to **Rear Compartment Trim Panel Replacement** in Body Rear End.
2. Disconnect the speaker electrical connectors (1).
3. Remove the rear shelf trim panel. Refer to **Rear Window Shelf Trim Panel Replacement** in Interior Trim.

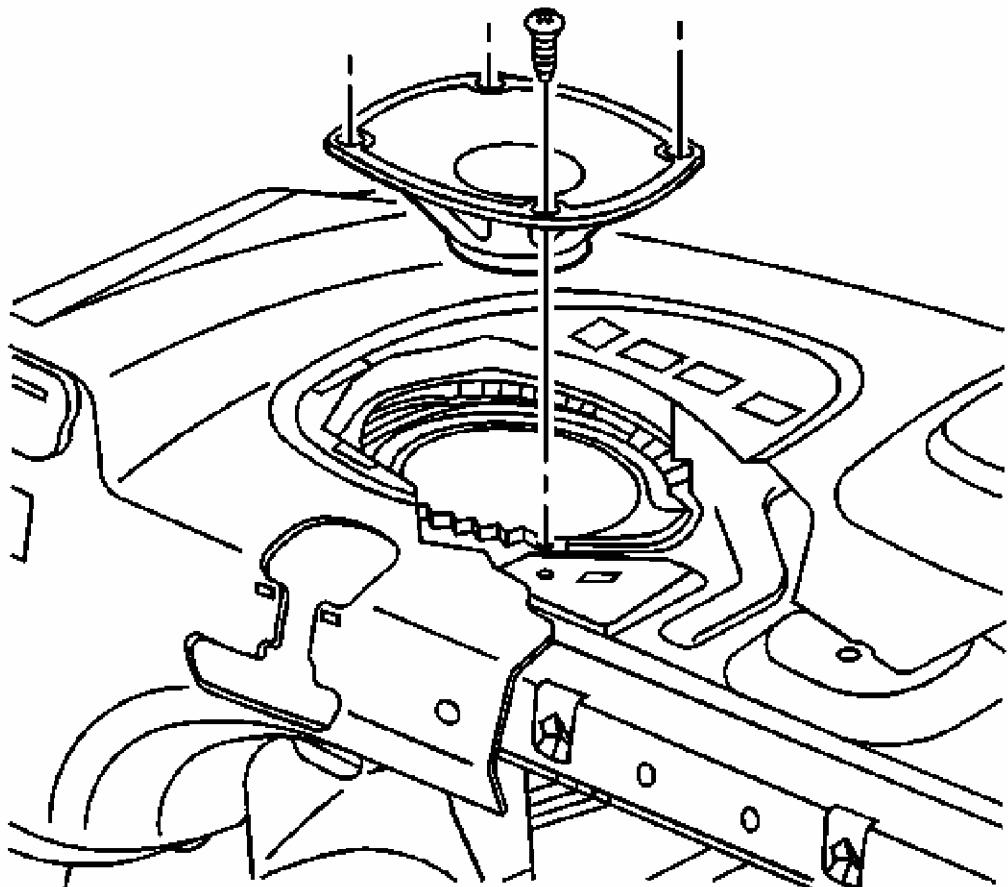


Fig. 53: Rear Speakers View
Courtesy of GENERAL MOTORS CORP.

4. Remove the speaker fasteners.
5. Remove the rear speakers.

Installation Procedure

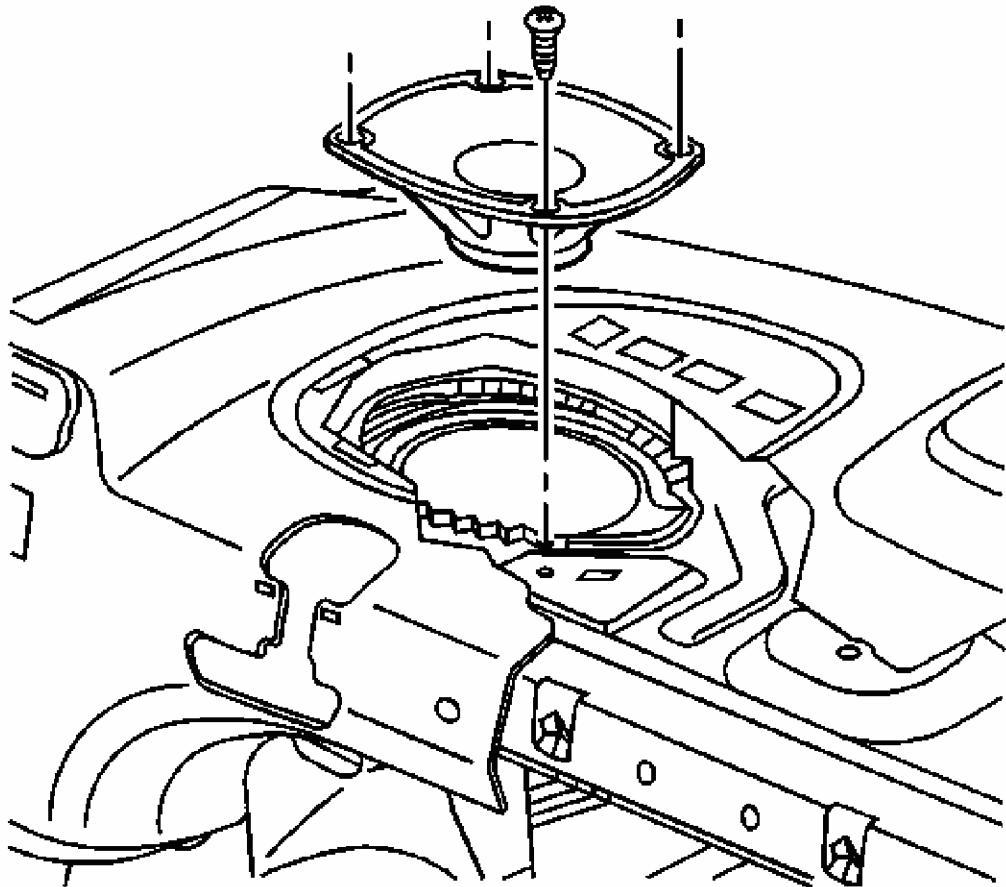


Fig. 54: Rear Speakers View

Courtesy of GENERAL MOTORS CORP.

1. Install the rear speaker into the opening in the rear shelf.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the fasteners.

Tighten: Tighten the fasteners to 2 N.m (18 lb in).

3. Install the rear shelf trim panel. Refer to Rear Window Shelf Trim Panel Replacement in Interior Trim.

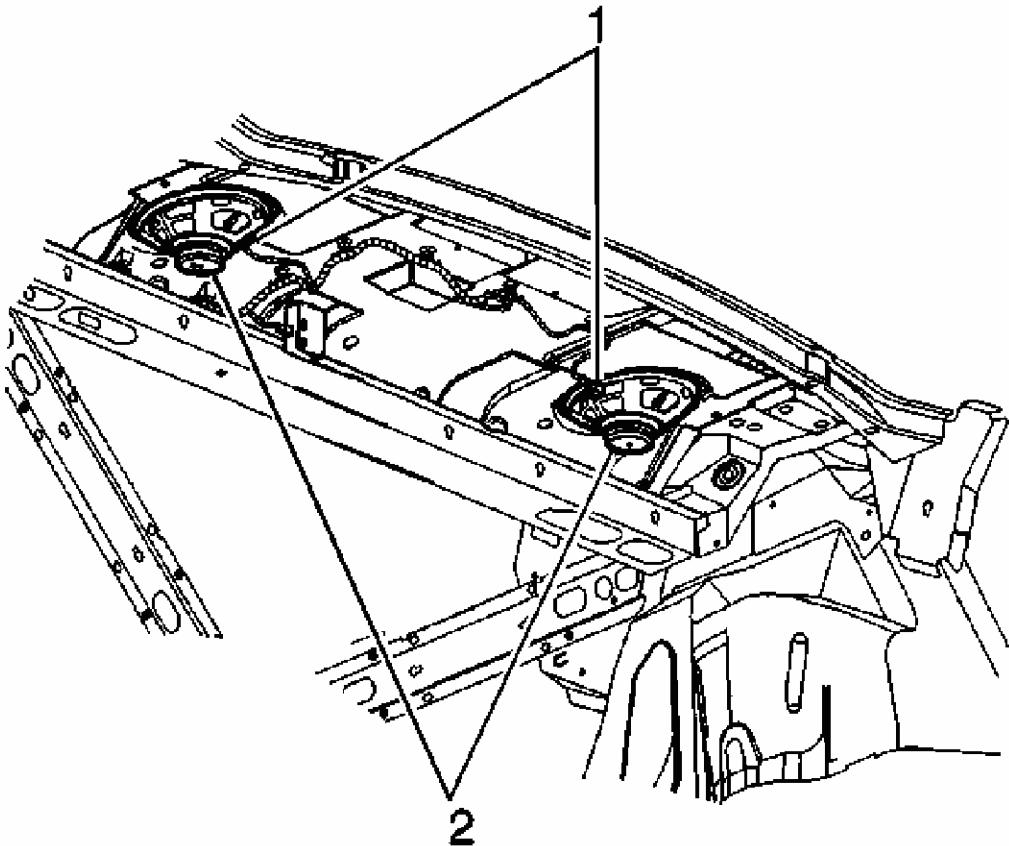


Fig. 55: Speaker Electrical Connectors View
Courtesy of GENERAL MOTORS CORP.

4. Connect the speaker electrical connectors (1).
5. Install the rear compartment trim. Refer to **Rear Compartment Trim Panel Replacement** in Body Rear End.

DESCRIPTION AND OPERATION

RADIO/AUDIO SYSTEM DESCRIPTION AND OPERATION

Contents

- RPO options
- Circuit description
- Component description
- Theft deterrent feature

- Customer tips

RPO Options

The entertainment system on this vehicle is configured with either a base or uplevel audio system. Both the base and uplevel audio systems contain a radio, antenna and speakers. The following shows the entertainment RPOs that are available for this vehicle:

- (U1C) AM/FM STEREO, SEEK/SCAN, CD, CLOCK, ETR
- (US8) AM/FM STEREO, SEEK/SCAN, CD, AUTO TONE, CLOCK, ETR, MP3, RDS
- (US9) AM/FM STEREO, SEEK/SCAN, RDS, MULTIPLE COMPACT DISC, AUTO TONE CONTROL, CLOCK, ETR, MP3
- (UQ3) 6 Speaker System
- (UQA) 9 Speaker System and Amplifier
- (U2K) Digital Radio

Circuit Operation**Radio Power**

The main radio power is supplied by a 15A fuse located in the RBEC. The radio does not require a discrete ignition feed circuit for power moding. The power moding is accomplished using a structure of virtual networks (VN). The Power Mode Master (PMM) transmits the GMLAN power mode signals.

The radio supports the following signals:

- System Power Mode
- Infotainment Operation Allowed

The radio also supports the following GMLAN Vehicle Power Modes:

- OFF
- ACCESSORY
- RUN
- CRANK REQUEST

Radio Ground

A wire in the main radio connector that is connected to battery negative at all times provides the main radio ground. Resistance between the ground pin and the vehicle battery negative terminal must not exceed 0.05 ohm.

Radio Speaker Outputs

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At low volume, the plus (+) and minus (-) speaker outputs circuits measure approximately 7-8 volts. If a plus or minus circuit for any speaker output is shorted to ground or voltage, the radio disables the circuit for component protection and sets a diagnostic trouble code (DTC). The radio sets the speaker circuit DTC on non-amplified systems only. As the radio volume increases the voltage on the plus and minus circuits change to create a voltage difference between each other. The difference in voltage is what drives the voice coil of the speaker producing sound.

Radio Head Unit Dimming

GMLAN signal data received by the radio determines the radio dimming and backlighting levels. The radio sets the backlight and VF display dimming to the value indicated by the interior dimming level and interior dimming display level signals in the GMLAN dimming information frame. The radio provides faceplate and control/graphics backlighting in the OFF (RAP inactive) when the exterior lighting VN is activated. The radio display is consistent then with the surrounding devices that use analog pulse width modulated (PWM) dimming to backlight their control/graphics when the power mode is OFF and the park lights are ON.

Amplifier Interface (UQA)

The main amplifier power is provided by a 20A fuse located in the body control module (BCM). A discrete switched 12-volt output is used to control the power state of the amplifier. To respond quickly to audio input and control signals, the amplifier is ON in all vehicle power modes except OFF and CRANK request. However, when the amplifier is asleep it still must allow chime functionality. The internal amplifier bridges are fully powered and unmuted when the amplifier receives the switched 12-volt input.

The radio provides a remote amp mute output circuit to control overall muting of remote non-GMLAN amplifiers with rear seat audio (RSA) applications. The amplifier receives PWM signals on the circuit at varying duty cycle percentages for controlling the muted and unmuted functions of the amplifier. The RSA enable circuit in the radio enables the rear seat channel muting of the amplifier. A Diag Sense circuit internal to the radio monitors the remote amp mute circuit for faults and sets the appropriate DTC when detected.

The function table below shows the 4 possible amplifier mute functions.

Radio/Audio System Description and Operation

% Duty Cycle Out	Function
0% (Vlow Vdc)	FOUR_CHANNEL_UNMUTE
50%	REAR_MUTE (input must be 2-channel)
100% (Vhigh Vdc)	ALL_MUTE

Amplifier Radio Speaker Inputs (UQA)

The low-level audio signals (LF, RF, LR and RR) from the radio are the inputs to the amplifier. The amplifier boosts these inputs and outputs them to the vehicle speakers. If one speaker plus or minus low level audio signal circuit is open between the radio and the amplifier, the input to the amplifier is approximately half. The speakers for that channel then operate at approximately half the normal volume or in some cases no volume.

The low level audio signals from the radio to the amplifier typically measure in the 4-5 volt range.

Amplifier Speaker Outputs (UQA)

At a low volume, the plus (+) and minus (-) speaker outputs circuits measure approximately 2-7 volts AC or 7-8 volts DC at the speaker connector when testing a normal working system. If a plus or minus for any speaker output is shorted to ground or voltage, the amplifier circuitry will turn OFF the front outputs or rear outputs for component protection.

Repeat speaker failure can be caused by a damaged amplifier. Test for a damaged quad bridge output in the amplifier if the wiring between the amplifier and speaker test negative for a short to voltage. Prolonged exposure to DC voltage can cause a speaker coil to short. An early indication of a shorted speaker coil is distortion/noise and eventual failure.

Remote Radio Audio Signal Inputs

Audio output from the OnStar(R) communications module connects to the remote audio signal inputs of the radio. When the cellular telephone mute signal goes to 0 volts, the radio over-rides any other audio signal and uses these inputs as the source for the output to the speakers.

Cellular Telephone Mute

The OnStar(R) communications module uses the cellular telephone mute signal circuit to override the radio for OnStar(R) communication. When cellular telephone mute is not active, this circuit is held at 1-volt by the radio. When the cellular telephone mute signal is pulled to ground, the radio over-rides any other audio signal and uses the remote audio signals as the source for output to the speakers. If the radio was OFF when this circuit is pulled low, the radio will turn ON. Additionally, the radio fades the speakers to full front, adjusts the volume to an initial audible level and sets an Auto Tone designed for optimal use with OnStar(R). When the mute signal is no longer pulled to ground, the radio returns to the mode it was in previously.

Component Description**Antenna System**

The antenna system receives broadcast AM or FM stereo signals from free space and sends the signals to the radio receiver for processing via a coaxial antenna cable. Good antenna grounding is important for good radio reception.

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Radio

The operator interfaces with the radio system through the radio display and controls. Through these controls the operator is able to control system power, volume, fade, balance, bass and treble equalizations. Control on the integrated CD, MP3 or XM satellite radio system is also available when equipped with these options. A vacuum fluorescent display (VFD) provides system feedback to the operator.

The radio processes the AM and FM signals from the antenna system or the information from the CD media, amplifies that information and sends the output to the speaker system.

The radio is located in the instrument panel center stack area and is fastened to the instrument panel by fasteners. A rear bullet type guide pin is provided to aid in aligning the radio. An electrical connection to the radio is a 30-way connector that is part of the instrument panel (I/P) harness, antenna lead connector and an additional 16-way harness connector is present on OnStar(R) equipped vehicles. Additional service length is provided in the radio harnesses to allow connection prior to radio installation.

Radio amplifier outputs to the speakers are protected from damage should speaker leads become shorted to ground or shorted to vehicle power. The radio will sense these conditions and shut down the amplifier outputs in a non-destructive manner. After the short condition is removed, the radio will return to normal operation.

Speakers

UQ3 consists of 6 speakers. One 6 inch speaker is mounted in each door and 2 one-inch tweeter speakers mounted in the A-pillars. UQA consists of the standard 6 speakers with the addition of one 3.5 inch speaker mounted in the center of the dash and 2 speakers mounted in the rear shelf. UQA has a total of 9 speakers.

Auxiliary Jack Socket

The AM/FM Stereo CD radio shall provide a 3.5 mm auxiliary stereo jack that will allow playback of audio signals from remote devices (e.g., portable tape player, portable CD player or MP3 playback device, etc.).

OnStar(R)

OnStar(R) equipped (RPO UE1) vehicles use the radio amplifier and speaker system for voice communication from the OnStar(R) operator to the vehicle. Voice communication from the vehicle to the OnStar(R) operator is through the OnStar(R) microphone and module, which is not a part of the radio system.

When OnStar(R) begins operation, the radio volume is set to a preset level, auto tone preset for OnStar(R) becomes active and the fade control is adjusted to the full front speakers. The radio volume control can then be used to adjust the volume to a desired level.

The radio system and OnStar(R) system are connected through the 16-way connector at the back of the radio. Left and right channel OnStar(R) audio, mute control of radio functions by OnStar(R) and the audio signal ground are the circuits provided in the 16-way connector. Disconnecting the 16-way connector from the radio will isolate the radio system from the OnStar(R) system.

Voice communication from the vehicle to the OnStar(R) operator could be possible under this condition. However, the vehicle occupant will not be able to hear the OnStar(R) operator.

For more information regarding radio operation problems, refer to **Symptoms - Entertainment**. For further information regarding OnStar(R) operation, go to the OnStar(R) part of this service information.

Theft Deterrent

The radio theft deterrent system is intended to disable radio functionality if incorrect vehicle information is received by the radio. The radio disables functionality if the VIN information received by the radio does not match the VIN information that has been learned by the radio. A VIN sequence is the last 6 digits of the VIN. The radio receives this information in a GMLAN frame form.

The radio shall provide the following theft operating modes as part of the radio theft deterrent system:

- No VIN Mode-A radio that has not received or learned a VIN. In this mode the radio has limited functionality.
- Normal Mode-A radio has received a VIN sequence. The radio only learns the VIN sequence if the VIN sequence contained all 6 digits. In this mode the radio has full functionality.
- Theft Detected Mode-A radio that had previously learned a VIN sequence and subsequently received a VIN sequence not matching the learned sequence. In this mode the radio has limited functionality.

Customer Tips

Radio Reception FM

- The best FM fidelity will be obtained from stations within 16-64 km (10-40 mile) range. Noise or distortion may become apparent when attempting to receive stations at distances greater than this range. SUGGESTION: Reduce treble response when attempting to receive fringe stations.
- Tall buildings or hills may cause a degraded or lost signal. FM signals tend to travel "line of sight". SUGGESTION: Reduce treble response around tall buildings.
- In some instances. SUGGESTION: Reduce treble response around tall buildings.

- Although receiver circuits are among the most advanced type available, there are instances where one radio station can interfere with another station. SUGGESTION: Select another station or switch to a cassette or CD.

Radio Reception AM

AM reception is sensitive to storm disturbances such as lightning. SUGGESTION: Reduce treble response or switch to FM.

Care of Compact Discs

- Handle compact discs (CDs) carefully. Touch only the outer edges of the CD or the edge of the hole in the center of the CD. Never touch the glossy side of the CD. Fingerprints and scratches will interrupt the "reading" of the information on the disc.
- Store CDs in their protective cases. Store CDs away from sunlight, dirt, dust and debris.
- Do not attach a label or tape to a CD.
- Always check for scratches and signs of wear on both sides of the CD.
- Never place any marks on the CD with a marker.
- If a CD becomes contaminated, clean it with a clean, damp, soft, lint-free cloth and mild detergent. Wipe the CD in a straight line from the center hole outward. Do not use cleaning solutions which may damage the CD, such as chemically treated cleaning cloths, benzene or paint thinners.

Compact Discs Not Appropriate to Use

These CD players were designed to be compatible with round digital audio CDs with the "Compact Disc Digital Audio" label. Other CDs may be incompatible, causing a no-play condition, excessive skips and "ERR" shown on the radio display or a jam in the loading mechanism. Some incompatible CD types are:

- Special-shaped CDs (any that are not round)
- Re-Writeable CDs (CD-RW type are incompatible)
- Recordable CDs (CD-R type are incompatible, except with US8 or US9 radios)
- Library CDs (with thick bar code labels)
- CD with User-applied labels

AM/FM Reception**Radio Signal**

The radio signal is sent from a broadcast station and is then received by an antenna. The strength of the signal received depends on the following:

- The power output or wattage, of the broadcasting station
- The location of the vehicle or receiver, relative to the broadcast tower
- Obstacles between the tower and the receiver
- Atmospheric conditions
- Which band, AM or FM, the station is broadcasting
- Type of antenna and the ground plane

AM Reception

The AM band has a lower frequency range than the FM band. These longer wavelengths:

- Bend around obstacles
- Follow the curvature of the earth
- May reflect or skip, off of the ionosphere

The AM frequencies have longer range due to the ground wave. The ground wave follows the curvature of the earth and is affected by its conductivity. Greater conductivity equates to less signal loss, thus transmission over water is better than over land. The AM band has a range of 80-320 km (50-200 mi).

FM Reception

The shorter wavelengths of the higher frequency FM band:

- Reflect off obstacles
- Are absorbed by the ground
- Penetrate the ionosphere

Broadcasts in the FM band are limited to "line of sight" reception which is typically 40 km (25 mi). Even when out of a direct line of sight, the signal may be reflected into areas that would be in a "shadow" otherwise. Factors which affect the line of sight include:

- Height of the broadcast antenna
- Height of the receiving antenna
- Terrain and buildings in the broadcast path

XM Reception

XM satellite radio provides digital radio reception. The XM signal is broadcast from 2 satellites and, where necessary, terrestrial repeaters. The high power satellites allow the antenna to receive the XM signal even when foliage and other partial obstructions block the antennas view of the satellite. Terrestrial repeaters are used in dense urban areas. These

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repeaters will receive the satellite signal and re-broadcast them at much higher power levels in order to ensure reception in areas with densely packed tall buildings.

XM Satellite Radio

XM is a national satellite radio service that offers up to 100 coast to coast channels including music, news, sports, talk and children's programming. XM provides digital quality audio and text information, including song title and artist name. A service fee is required in order to receive the XM service. For more information, contact XM at www.xmradio.com or call 1-800-852-9696.

Digital Radio Receiver

The radio controls communicate with the digital radio receiver via the serial data communication circuit. The digital radio receiver sends remote radio audio signals to the radio.

Viewing Messages

Press the DISP or RCL button while in XM mode to view various pieces of information related to the current song or channel. By pressing and releasing the DISP or RCL button, you may view 4 different categories of information: Artist Name/Feature, Song/Program Title, Channel Category and other Additional Information that may be broadcast on that channel. Additional Information messages may not always be available. If an Additional Information message is being broadcast on the tuned channel, the INFO icon will appear on the display. Each of the 4 information types may have multiple pages of text. To reach a category, press and release the DISP or RCL button consecutively until the desired type is displayed. If there are multiple pages of text for the selected information type, the radio will automatically display all the pages for that type at a rate of approximately one page every 3 seconds before timing out and returning to the default display. You may override this feature by pressing the DISP or RCL button to review all of the pages at your own pace.

Radio/Audio System Description and Operation

XM Advisory Messages	Condition
Updating	Updating encryption code
No Signal	Loss of signal
Loading XM	Acquiring channel audio (after 4 second delay)
CH Off Air	Channel not in service
CH Unavail	Channel no longer available
No Info	Artist Name/Feature not available
No Info	Song/Program Title not available
No Info	Category name not available

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Not Found	No channel available for the chosen category
No Info	No text/informational message available
XM Locked	Theft Lock active
Radio ID	Electronic serial number (ESN) channel 0
Unknown	Radio ID not known (should only be if hardware failure)
Chk XMRevr	Hardware failure

Technical Information for the MP3/CD Radios

The US8 and US9 radios will play both standard audio CDs and CD-Rs or CD-RWs. The CD-R/RWs may contain either standard audio (*.cda) or compressed audio (*.mp3). Customers who record their own music CD-R/RWs should be aware of the following:

- The files can be recorded on a CD-R/RW disc with a maximum capacity of 700 MB.
- The radio will play only compressed audio files recorded in the *.mp3 format. It also supports playlists that can be made and saved with popular MP3 software (in the *.m3u format). A playlist name must be no more than 32 characters in length. If the name of a playlist is longer than 32 characters, the radio will ignore the playlist.
- The radio will only play audio from a CD-R/RW, it cannot record audio.
- The radio will play a mixed mode CD-R/RW (one recorded with both *.cda and *.mp3 files). If a mixed mode CD is inserted in the radio, the radio will assign the standard CD audio to a directory which is listed as ROM audio directory.
- The radio supports multi-session discs, but only the files from the last session will be played.
- There are a total of 20 directories (folders) allowed on a disc. The file structure can be 0-4 directories deep (a folder within a folder, within a folder, etc). Anything more than 20 directories will be ignored. Each directory may have up to 99 files contained within it. Files not having the *.mp3 extension will not be played, but still count toward the maximum. Anything more than the first 99 files within a directory will be ignored. A single disc may have up to 254 files and directories. Anything beyond the 254 limit will be ignored.
- MP3 files must be written to a CD-R/RW in one of the following industry-standard formats:
 - ISO 9660 Level 1
 - ISO 9660 Level 2
 - Joliet
 - Romeo
- ID3 tag information is displayed by the radio, if available. The ID3 tag information can

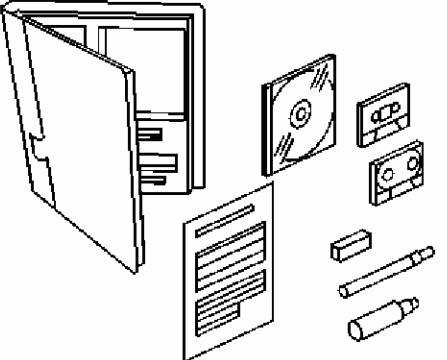
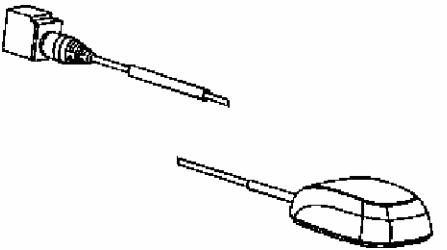
either be version 1 or 2. The radio will display the filename, song name, artist name, album name, directory name and playlist name, etc.

If the customer does not follow these guidelines when recording a CD-R/RW, the disc may not play in the US8 or US9 radio.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/Description
	<p>J 39916-A CD and Cassette Diagnostic Audio Kit</p>
	<p>EL-48028 Digital Radio Test Antenna</p>

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